Information: an essential factor in educational planning and policy

Edited by George Psacharopoulos

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Preface

This source-book has its immediate origins in the Symposium on Future Programmes of Information and Communication in Educational Policy and Planning, held at Unesco Headquarters in Paris from 21 to 25 November 1977. It is essentially the product of Unesco's increasing concern with a balanced flow of information in the process of educational decision-making for change. This interest has been explicitly shown on several occasions, such as the nineteenth session of the General Conference of Unesco (Nairobi, Kenya, 1976) and more recently the thirty-sixth International Conference of Education.[1] Numerous documents on the subject have been produced, either as background papers for conferences or as monographs on specialized subjects.[2]

In preparing this volume, Unesco wished to synthesize some of the foregoing work for educational planners and decision-makers in developing countries, to take stock of the existing literature on educational 'information', 'networking' and 'exchange' and to see if any practical action could be taken for increasing and improving the information flow.

Part I deals mainly with concepts and is intended for those wishing a quick overview of the subject. It lists the kind of information likely to be demanded by the educational planners and policy-makers in a given country and indicates how this information may be obtained. An evaluation of the existing system of information exchange in this field is given and alternatives proposed. Part II is a collection of essays on problems faced by educational planners in developing and newly emerging industrialized countries. Most of these papers were presented in an extended form at the symposium mentioned above. Thus, the two first parts represent a contrast between the ideal type of information the educational decision-maker should have at his disposal and the actual situation in certain countries.

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[1] See Unesco/ IBE, *Final Report, International Conference on Education, Thirty-sixth Session, Geneva, 30 August to 8 September 1977.*

[2] See the 'Reports and Studies' series issued by Unesco's Division of Education Policy and Planning.

The remainder of the source-book is devoted to more specific aspects of the subject. Part III contains two separate chapters: one on the many conceptual issues and problems faced by those attempting to open up communication channels for improved educational policy towards change; the other on practical problems encountered in attempting to set up an international information network in education. Finally, Part IV contains sources of educational information. The chapters feature a detailed annotated bibliography on information networks, a directory of institutions in Asia, Africa, the Arab States and Latin America which produce or exchange information on education, and a discussion of international information networks.

In publishing this volume, Unesco hopes to provide a useful reference book for educational planners and to stimulate their professional dialogue. Readers are invited to share their comments, as well as additional information on the topics treated, by writing to the Division of Educational Policy and Planning, Unesco, Place de Fontenoy, 75700 Paris, France.

The selection and presentation of the material contained in this source-book are the responsibility of the editor, but the views expressed in the various chapters are those of the respective authors and not necessarily those of their organizations or of Unesco. The designations employed and the presentation of material throughout the publication do not imply the expression of any opinion whatsoever on the part of Unesco concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.

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PART I

INFORMATION NEEDS IN EDUCATIONAL PLANNING

George Psacharopoulos

Information in itself is silent;
it is the use to which it is put . . .
that is important.

Oskar Morgenstern

1 Introduction

Educational decision-making is an extremely complicated process. A host of actors is involved at a variety of levels pursuing different objectives. The analysis of the interactions between these actors spans several disciplines: education, sociology, economics and politics. Because of the complexity and interdisciplinary character of the educational decision-making process, global treatments of it are often vague and ambiguous. The tendency towards generality becomes stronger when one adds an international dimension to educational-planning discussions. The end result is that the practitioner in a given country who turns to the literature might in fact be put off, rather than helped, regarding a particular problem.

In what follows, I have decided to deviate from tradition and be as specific as I can. Specificity is of course gained at the expense of forgetting 'another factor' that might be relevant to the particular issue. However, this is a normative value judgement I have made, my main concern being the usefulness of the end product. Thus one of the tasks of this book is to go through a variety of terms and slogans and try to clarify some of the semantics and jargon used in this area.

The starting-point is the 'problem', i.e. a happening or event that sparks off the need for the 'educational decision-maker' to seek 'information' regarding the solution of the problem. Evidently, that which is a problem in country X might not be considered a problem in the context of country Y. Therefore, one needs to examine the 'criteria' according to which a problem is likely to arise. Different criteria, in turn, may lead to different adopted procedures to solve the particular problem, thus giving rise to different kinds of information needs.

The educational decision-maker

But who is the 'educational decision-maker' in the first place? To me, the following persons or groups of persons are likely to make decisions affecting education in a given country:

The Minister of Education or other high government officials in their roles as instigators of educational change and innovation and/or administrators of an adopted educational policy.

The technocratic government officials who, in elaborating an educational plan and absorbing the international and domestic educational conditions, influence the administrators, above, on what is a 'problem' to take action upon and/or generate 'information' demands in order to carry out their task.

The general public, especially pupils, students and their families who determine what level and kind of education they will seek from the State or private institutions and/or how this education will be financed, e.g. State, family, or forgone earnings.

The employers of labour in the economy as a whole who make specific demands for specific kinds of skills to be hired and/or offer on-the-job training opportunities to their employees.

All these groups of people are likely to be helped by having 'information' relevant to their action in the educational sphere.

The problems giving rise to information needs

The different actors above face different problems, which I shall now try to define. For that to be done, the likely operating criteria of the different actors must first be spelt out.

THE MINISTER OF EDUCATION AND THE CENTRAL AUTHORITIES

It might be said that the overriding criteria of the minister are purely political, thus not demanding information other than, say, the political line of the party he belongs to. However, this is rarely so. Ministers want to be informed on the degree of popularity of their policies, and thus want to monitor public opinion in this respect. It is often the case that the political party line might change following the expressed view of certain social groups (e.g.the 1968 students' movement in France). Therefore, at the highest level of decision-making, the information problem might be that of monitoring social attitudes towards specific (often politically oriented) policies before, say, a conflict arises.

INFORMATION DEMAND AT THE TECHNOCRATIC LEVEL

No matter what the political aims of the minister, it has been a custom for most countries to have an 'educational plan'. This plan is usually prepared by a local team of experts, sometimes using consultants from abroad. Educational plans often have a multiplicity of objectives, the list of which is currently expanding very quickly, and each objective gives rise to the need for particular kinds of information for incorporating it in the plan.

Thus the traditional educational objective in developing countries has been that of literacy. Towards the mid-1950s, this objective was nearly replaced by manpower considerations and economic growth targets. The late 1960s witnessed the income-distribution objective, to be followed by employment in the early 1970s. A parallel development since the late 1960s has been that of satisfaction of the social demand in developing countries, mainly borrowed from the experience of more advanced countries. Perhaps the social-demand criterion is dominant in most countries today, with a manpower-consideration correction for post-secondary education. Furthermore, the elaboration of educational plans, at least on paper, tries to take into account some additional objectives such as: (a) increasing the participation of the parties involved (i.e. parents, students and teachers); (b) adding an intersectoral dimension (i.e. bringing together different ministries concerned with formal, non-formal and informal educational activities); (c) putting more emphasis on the regional and local needs of the country; (d) increasing democratization by reducing selectivity and opening educational opportunities to girls and other disadvantaged groups; (e) satisfying the basic needs of the population, a concept developed in the context of the World Employment Programme of the International Labour Organisation (ILO); and (f) fostering self-reliance in terms of less dependence on other countries (e.g. 'Africanization' of newly independent States).

Each one of these old and modern goals raises a multiplicity of problems for the educational decision-maker and leads to demands for particular pieces of information, which will be examined in detail in the following chapter. By way of introduction, it suffices to mention at this point the major problem areas where information is vital:

For the objective of literacy, one needs to know not only the age and educational attainment by regional distribution of the population but also the cost-effectiveness of different available technologies for improving literacy (e.g. adult courses, radio, television and satellite broadcasting).

For the objective of economic growth and manpower needs one must have good knowledge of the links between education and the economic system, plus a host of other parameters depending on the particular methodology one wishes to follow (e.g. manpower-forecasting or rate of return).

For the objective of employment, one must know the labour force participation and unemployment rates of the educated, a non-existing statistic in many countries today.

Social demand satisfaction necessitates thorough knowledge of population dynamics and of people's responses to economic and other incentives (e.g. fellowships, grants, tuition fees and educational loans).

Regional concerns require disaggregation of many national statistics by geographic area.

The objective of democratization and equality of opportunity presupposes disaggregation of national statistics by sex, by socio-economic categories and by population (e.g. tribal or ethnic) groups.

Most of the pieces of required information in terms of the modern goals of educational decision-making are not readily available in most countries.

INFORMATION DEMAND RELATED TO THE STUDENT AND HIS FAMILY

Educational policy today could be conceived of as attempting to do either of two things (or a combination thereof): to change some part of the system (e.g. increase initial participation of girls in university education) and/or to adapt to overriding circumstances that occurred somewhere else in the system (e.g. increase the number of university places following social demand pressure).

Both cases require particular kinds of information. To change a system presupposes knowledge of how it functions. The information referred to here is technically known as 'supply response', i.e. factors affecting the individual demand for education. This information overlaps to a great extent with that required by the technocrat in the previous section. Moreover, there is another component of information, flowing from the planner to the public, namely information provided by the planning authority to students and their families so that they make more informed decisions before expressing a 'social demand' for particular kinds or levels of education, and/or are influenced to behave the way the planner wants them to behave. This latter function of educational information flowing from the planner towards the public is becoming increasingly important and comes under the label of 'self-selection' or 'professional orientation'.

INFORMATION RELATED TO EMPLOYERS' ACTIVITIES

Employers of educated labour in a given economy play a double role regarding educational planning. First, they use skilled labour, and second they produce it as well by offering on-the-job training.

The demand for educated labour by employers overlaps with the link the technocratic planner seeks between the economy and education. Information on this link can be found from: aggregate census data regarding the occupation/education/economic sector nexus; general employment survey data or tracer studies, which are now becoming very common; and firm or employer's surveys, which now tend to diminish in importance.

The supply side of the employers' function as producers of certain skills is more difficult to assess. Here, studies at the firm level are a must, although nuances like the provision of 'general' rather than 'specific' skills and the difficulty of drawing a dividing line between them pose certain problems.

One particular category of employer that recently has received increased attention in educational planning is the public sector. If for certain skills or types of graduates the public sector is the dominant employer, then information on its salary scales can be used to serve two essential purposes in educational planning: first, the public–private differential in salaries and other employment conditions can be used to explain people's behaviour regarding their demand for acquisition of certain skills; second, civil service pay scales can be manipulated so as to affect the structure of social demand for education.

The kind of information required is one thing and the way to obtain, disseminate and use this information at the local, national and international level is another. The next two chapters deal with these issues in turn.

2 Information on what?

In this chapter, I will try to spell out particular kinds of 'information' the educational decision-maker would like, or rather should have, at his disposal in order to carry out his task in a satisfactory way. The fact that many educational systems today are allowed to follow their own momentum or are 'planned' according to back-of-the-envelope information, if not mere insight, should not deter one from asking what the proper procedure might be.

The discussion in this chapter is organized around two axes: one is the particular goal the policy-maker wishes to achieve; the other refers to the methodology followed by the technocrat who elaborates the plan. Of course the two axes overlap to a great extent sometimes because the adoption of a given goal largely dictates the methodology to be used.

A taxonomy of educational-planning methodologies

The basic methodologies according to which decisions are prepared in education have not changed much over the last two decades or so. By contrast, considerable refinement of particular techniques has taken place. Thus one could classify the existing 'models' according to which decisions are prepared into two large groups (see Taxonomy 2.1): those that do not make particular demands for 'information' (as the term is used in this book) (A), and those that do (B).

The 'models' of inertia and outright political decision-making belong to the first group. As said in the previous chapter, the politician might wish to have information feedback from the electorate on the social acceptance of his policies. However, one should relegate this kind of public-opinion poll to the information necessary under the 'social demand' model (**B** (1) in Taxonomy 2.1). Also, one should not attribute to the political model decisions that are taken after the politician has been persuaded on a certain policy following the application of a group **B** model.

TAXONOMY 2.1. Educational-planning models

- A. *Non-information-demanding*
    - 1. Inertia
    - 2. Political
- B. *Information-demanding*
    - 1. Social-demand-oriented
    - 2. Manpower-oriented
        - (a) Manpower-forecasting type:
            - (i) based on domestic OCC–ED–SEC (occupation—educational level—number employed in economic sector) evidence
            - (ii) based on international comparisons
        - (b) Cost-benefit type:
            - (i) based on cross-sectional or longitudinal data
            - (ii) based on tracer studies of recent graduates

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An example of a purely political decision might be the replacement of university entry examinations by a lottery under a Socialist government so that the traditional class structure is not perpetuated via education. Conversely, it might be the restitution of the traditional grammar school system under a Conservative government in the United Kingdom. The political model does not need much information in order to be applied and the same holds for the model of inertia, i.e. a case where educational administrators follow year after year past budget-allocation decisions without any move towards change.

It is my belief that most educational decisions in today's world are taken according to models A (1) and A (2). This is to be regretted, especially for those countries that proceed by means of inertia. It is my contention that a lot could be gained by moving towards a group B model that could be well applied within the political constraints they face.

Let us now move to the information-demanding models (group B in Taxonomy 2.1), which can be of two general types: (1) social-demand-oriented or (2) manpower-oriented. The philosophy of the social-demand model is to provide the necessary school or university places to all those who wish to enrol and have the general ability to do so. Thus the social-'demand' model is, ironically, concerned with the 'supply' of education in a given country. By contrast, the manpower-oriented models are genuinely concerned with the 'demand' for educated labour by the economy in order to satisfy production or allocative efficiency targets.

In Taxonomy 2.1 the manpower-oriented models are further classified into two sub-categories: (a) those using the methodology known as 'manpower-forecasting' and (b) those using cost-benefit analysis. Manpower-forecasting, as the name implies, consists in attempting to project into the future a three-dimensional matrix, i.e. the number of people employed by economic sector (SEC), occupation (OCC) and level of education (ED). The basis of this projection can be either domestic evidence of the country's OCC–ED–SEC structure, or in the absence of such data (as is often the case in developing countries), the projections are based on 'international comparisons', i.e. by observing the OCC–ED–SEC matrix of a country at a more advanced stage of development.

Cost-benefit analysis on the other hand is concerned with what society 'pays' relative to what 'return' it gets by educating one extra person at the margin. This approach favours promoting those levels of education that exhibit the highest social cost-benefit ratios. Again, this type of analysis can proceed on the basis of two sets of data: either historical and cross-sectional, or data generated by 'tracer studies', a new breed of information-gathering to be examined later in this chapter.

A taxonomy of goals

When the art of educational planning started in the late 1950s or thereabouts, the main goal was that of economic growth. Actually, it was from explanations of past productivity growth that education emerged as a form of capital.[1] Initially the main drive was towards the creation of the required 'high-level manpower' the country needs for economic development and growth. Later (towards the mid-1960s), this gave way to concern about the optimal allocation of resources to education (see Taxonomy 2.2). Note that creation of the required 'high-level manpowar' and 'optimal resource-allocation' are very different goals indeed. For example, a country may allocate a substantial amount of its resources to the education of electrical engineers allegedly required for economic

TAXONOMY 2.2. Goals to be achieved by educational policy

A. *Traditional goals*
  1. Generation of economic growth by:
    (a) creating the required high-level manpower
    (b) optimizing social allocation of educational resources
  2. Satisfaction of social demand
B. *New central goals*
  1. Provision of social justice by:
    (a) improving income distribution
    (b) reducing educational inequalities
  2. Generation of employment
C. *New peripheral goals*
  1. Self-reliance
  2. Integration of formal and non-formal sectors
  3. Participation

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[1] See T. W. Schultz, 'Investment in Human Capital', *American Economic Review*, March 1961.

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development. However, allocation of the resources towards primary education might be a better use of the limited educational budget.[1]

A nearly parallel development since the early 1960s has been the establishment of social demand as a traditional goal of educational policy. This was instigated by the Robbins report[2] in the United Kingdom—quickly imitated, at least on paper, by several countries at a lower level of economic development.

As already stated in Chapter 1, new central goals of educational policies include social justice and employment generation. Initially social justice was identified with improvements in income distribution. However, because of difficulties in measuring this social indicator in developing countries, there has been a general move towards 'basic needs', a broad goal embracing many improvements touching upon the welfare of poor people in those countries.[3]

In Taxonomy 2.2, I have included a category of new 'peripheral' goals in educational planning, although 'off-beat' might have been an equally suitable adjective. Today's common goals of self-reliance and participatory, intersectoral educational planning, among many others following from the new international economic order, are difficult to treat analytically in a concrete way.[4] Much of what they involve could be relegated to some other more concrete or traditional goals. Therefore, I have included them in the list for future reference.

The information omnibus

Given the above methodologies and educational-planning goals, what are the specific bits of information (statistical or other) the decision-maker would (or should) have at his disposal in order to be helped in his task? The sequential list of such information was derived by following a natural (although not unique) time path of educational-planning activities. The information will be presented at an aggregate level and then, perhaps, disaggregated for the purpose of using it in particular models. Obviously, one must observe a balance between aggregate information and micro-information. At both extremes a piece of information can be either useless or very valuable. For example, aggregate data, derived by using micro-data, are a must for checking general equilibrium conditions. On the other hand, too much reliance on micro-data can become anecdotal and have little value for planning at the national level.

The natural steps in the educational-planning procedure we adopt here are the following:

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1. See C. R. S. Dougherty and G. Psacharopoulos, 'The Misallocation Cost of Investment in Education', *Journal of Human Resources*, Fall 1977.
2. See Lord Robbins *et al.*, *Higher Education*, London, Her Majesty's Stationery Office (HMSO), 1963.
3. See International Labour Office, *Employment, Growth and Basic Needs: a One-World Problem*, New York/London, Praeger, 1977.
4. For an elaboration of some of these concepts see Jan Tinbergen *et al.*, *Reshaping the International Order: a Report to the Club of Rome*, New York, Dutton, 1976.

Step 1. The planner assesses the social demand for places in different educational institutions (supply side).

Step 2. The planner assesses the demand for qualified manpower for serving production targets (demand side).

Step 3. The planner attempts to reconcile probable imbalances between supply and demand, as they result from steps 1 and 2.

Step 4. The planner might wish to incorporate neo-classical (in educational planning terms) criteria for arriving at his preferred solution, such as income distribution and employment.

Step 5. The planner might wish to 'correct' the previous 'solution' in order to take into account peripheral goals such as self-reliance, participation and sectoral integration.

Each step and each possible procedure followed within a given step will give rise to different kinds of information as explained below.

Assessing social demand

This is sometimes (and more correctly) called 'individual demand for education'.[1] It amounts to predicting for some years in the future the number of school and university places likely to be demanded by students and their families. Analytically, the projection model is, *grosso modo*:[2]

$$S_t = P\,S_{t-1} \pm M_t \qquad (1)$$

where: S_t is a vector of student enrolments by educational level in year t; S_{t-1} is a similar vector referring to one year in the past; P is the so-called transition probability matrix; and M_t are 'migrations', i.e. inflows (+) or outflows (−) between the educational system and the outside world in year t.

To illustrate, what formula (1) says is that the number of pupils in the sixth grade in primary schools in 1979 is equal to the number of pupils in the fifth grade in 1978 times the proportion of those who usually go on from the fifth to the sixth grade, plus any newcomers, e.g. from abroad.

Thus, in order to apply the social-demand model in its bare elements, the planner would like to have the following pieces of information:

INFO. 1

Past demographic trends and projection of the number of births for some years into the future

This information is necessary because the starting-point of any social-demand model is the number of school-age children who will enter the educational system at a given point in time.

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[1] See Organization for Economic Co-operation and Development (OECD), *Individual Demand for Post-secondary Education*, Vols. I and II, Paris, 1978.

[2] For expository purposes only the most crucial variables of a model will be presented and a couple of key references given. On the analytical side of projecting social demand, see R. Stone, 'A Model of the Educational System', *Minerva*, Winter 1965.

INFO. 2

Enrolments by individual grade (or class) and age for some years in the past

This information is necessary for the establishment of the transition probability matrix, i. e. the link between enrolments in grade 1 in year 1 to enrolments in grade 2, in year 2.

INFO. 3

Migrations of school-age population in and out of the country or region where the projection takes place

This information is necessary because, no matter what the number of births is, the demand for school places can be affected by migration. This information is vital in developing countries where rural–urban migration affects the demand for education at the regional level.

The three pieces of information listed above have long been considered enough to apply, albeit crudely, the social-demand model. However, although formula (1) above applies well to the compulsory-school levels, enrolments at the post-compulsory levels, especially higher education, are not subject simply to demographic considerations and transition proportions. People's behaviour also matters, and recent attempts have been made to understand what factors (other than demographic) affect the demand for post-compulsory levels of education. The projection model should try to explain students' plans or actual enrolment by a set of socio-economic characteristics like the following:[1]

$$D_h = (\text{household characteristics, price of education, expected monetary rewards}) \qquad (2)$$

where: D_h, a dependant variable, stands for the demand for, say, higher education as expressed by the students' aspirations to enrol or not in higher education; household characteristics include such variables as father's occupation and the number of siblings; price of education is measured by what the student is expected to contribute out of his pocket towards higher education. Even in a case of 'free education', students incur substantial costs because of forgone earnings; expected monetary rewards are measured by future salaries, as seen from the student's viewpoint. Even if the student is wrong in his expectations, anticipated returns can be used to explain private behaviour.

Application of formula (2) would not only 'explain' behaviour; the results could be used by the planner to affect behaviour via certain policies and/or compensate for certain adverse factors affecting particular disadvantaged groups of the population and thus equalize educational opportunities.

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[1] On the issue of exploring actual enrolments see J. Bishop, 'The Effect of Public Policies on the Demand for Higher Education', *Journal of Human Resources*, Summer 1977. For a case-study of exploring student plans, see G. Psacharopoulos and C. Soumelis, 'A Socio-economic Analysis of the Demand for Higher Education', London, London School of Economic and Political Science (LSE), 1978 (mimeo.).

In order to apply this version of the social-demand model, the following additional pieces of information are required:

INFO. 4

Student aspirations by region, socio-economic group and household composition
More specific variables to be measured under each sub-group above are family income, father's occupation, parents' educational level, house ownership, number of siblings, birth order and opportunity cost of studying, i. e. the student's forgone earnings in the occupation he could enter given his present educational qualification.

Going beyond social demand

Once the planner has somehow assessed the social demand for education, he might stop there and plan to provide the necessary places to all who want education. However, few countries can afford to do this. In most countries some sort of *numerus clausus* is in operation for at least two reasons. First, the country's resources are limited, and other sectors (like the health services or industry) also have claims on them. Second, even if resources were unlimited, there might exist social reasons why the State might wish to deviate from the social-demand model. For example, one of the reasons might be the discrepancy between private and social costs. In this case, individual decisions by the private investor will as a rule deviate from the social optimum. Or the State might simply wish to reduce graduate unemployment. Even the most affluent countries in Europe operate some sort of *numerus clausus* in their university system. The problem arises when one asks the question: 'On what criteria should one restrict enrolments here and encourage them there?' This leads us to the next common step in educational planning.

Assessing the demand for qualified manpower

As mentioned in the earlier taxonomy (Taxonomy 2.1) in this chapter, the assessment of the demand for qualified manpower can proceed on the basis of two diametrically opposite routes: manpower-forecasting or cost-benefit analysis. Let us start with manpower-forecasting, which, in spite of its many pitfalls,[1] is still the dominant methodology today.

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[1] See B. Ahamad and M. Blaug, *The Practice of Manpower Forecasting*, Elsevier, 1973.

The bare elements of the procedure consist in estimating for the target year of the plan the right-hand side of:

$$L_{occ} = B_{occ,\, sec} \, {}^{o}X_{sec} \tag{3}$$

where: L_{occ} is a vector of the required labour by occupation; $B_{occ,\, sec}$ is the labour-utilization coefficients matrix, namely the number of people of occupation 1, required per unit of production in economic sector 2, and so on; and X_{sec} is the vector of sectoral distribution of output.

As an example, what formula (3) says is that if automobile production will be 5 million in the future and if one engineer is required for the production of 100 cars, then the planner should aim at producing 50,000 engineers. The final step in applying this model is the $L_{occ} \rightarrow L_{ed}$ (4) translation, namely the transformation of the occupational vector into an educational one that relates to the output of schools or to the types of qualification the 50,000 engineers in the above example should have. Application of the manpower-forescasting model requires the following pieces of information:

INFO. 5

The three-dimensional cross-classification of the labour force by sector of economic activity, occupation and education
This information is necessary for establishing the B labour-utilization matrix above.

INFO. 6

The most likely or the target sectoral growth of output
This information is essential for establishing the vector X in formula (3) and is usually taken from the country's development plan.

INFO. 7

The likely future movement of productivity for each occupation and economic sector
This information is necessary for correcting the base-year B matrix for future productivity growth, since increases in productivity reduce the demand for certain kinds of skills.

INFO. 8

The formal educational content of each occupation
This information is necessary for the translation step $L_{occ} \rightarrow L_{ed}$. It amounts to recording the educational distribution equivalent of each occupation forming every single dimension of the L_{occ} vector.

The above information is sufficient for a crude manpower forecast to be made.

However, it might be that the country does not have the necessary data base for the construction of the B matrix, or that new occupations or kinds of education are envisaged in the future. For this purpose many countries apply the manpower-forecasting model by the method of 'international comparisons'. The method consists of observing similar variables in countries at a more advanced level of development in order to extrapolate the domestic situation. The information required is:

INFO. 9

Data on the OCC-SEC-ED distribution of the labour force in other countries

Now there is something magic-like in international comparisons: even if a country has a domestic data base, planners cannot avoid contrasting their solution to what happens in other countries. Therefore, no matter what the particular planning methodology is, international comparative data will be needed anyway.[1]

The leap between manpower forecasting and cost-benefit analysis

Most technocrats who make educational plans stop at this stage. Others, unfortunately the minority, question the meaning and validity of the previous procedure. What if the economy is more flexible in absorbing different kinds of educated labour without output loss? What about the costs of producing the required manpower? In what sense is the latter really 'required'?

Questions like these lead to analyses of the degree of flexibility of the conomy to absorb different mixes of educated labour; such analyses are commonly known as 'elasticity of substitution' studies.[2] Another step in recent educational-planning activities is to try actually to assess the degree of flexibility of the economy in this respect. This can be done by basically two methods, one formal and the other informal.

The formal method consists in estimating a variant of the function:

$$\text{Log}\,\frac{Wi}{Wj} = a + b\,\frac{Li}{Lj} \tag{5}$$

where: W is the wage level of skills i or j; L is the amount of labour used by skill level across the observations (usually firms or countries) where this model

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1. The substantive use of such data is another matter; see G. Psacharopoulos, 'Educational Planning: Past and Present', *Prospects*, Vol. VIII, No. 2, 1978, p. 135–42.
2. See G. Psacharopoulos, 'Manpower Assumptions versus Empirical Evidence in Manpower Planning', *De Economist*, November–December 1973.

is applied and the inverse of the b coefficient can be interpreted as the elasticity of substitution in production between skill levels i and j.[1]

What formula (5) measures in practice is the relationship between relative quantities of educated labour and relative salaries. When relative quantities of educated labour differ a lot, whereas relative salaries stay more or less constant, this can be interpreted as a high degree of substitution between educated labour in production. In order to apply this model one needs:

INFO. 10

Pairs of relative wages and relative skill utilization in a number of firms

This information would enable the econometric estimation of the elasticity of substitution. However, this information is not always available, and it also suffers from some as yet insurmountable statistical problems—let alone the possible discrepancy between salaries and marginal products of educated labour. Therefore an alternative procedure is just to observe the variability of the relative-utilization of educated manpower in firms producing the same or similar product; i.e. to estimate the coefficient of variation of Li/Lj across different firms producing the same product. If this is on the high side, then one establishes the *de facto* existence of substitution possibilities.[2] The necessary information to apply this 'model' is only part of INFO. 10 and therefore is not listed separately here.

Results of exercises such as the ones discussed above yielding high degrees of flexibility of the economy to absorb different mixes of educated labour have persuaded many educational planners to proceed on the basis of cost-benefit analysis.

Cost-benefit analysis

This model consists of assessing the marginal social costs and benefits associated with given incremental levels of education with a view to encouraging those levels or kinds of education that exhibit the highest benefits relative to costs.

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[1] For an application of this model across countries rather than firms, sees S. Bowles, *Planning Educational Systems for Economic Growth*, Harvard University Press, 1969; G. Psacharopoulos and K. Hinchliffe, 'Further Evidence on the Elasticity of Substitution between Different Types of Educated Labour', *Journal of Political Economy*, July–August 1972.

[2] For an application of this method to the electrical engineering industry in the United Kingdom, see G. Psacharopoulos, 'La Substituibilidad de la Mano de Obra Calificada en Las Empresas Industriales', *Demografía y Economía*, Vol. VI, No. 3. 1972.

At the crudest level, it consists of finding the social rate of return (r_s) to educational level s, i.e. by evaluating the expression:

$$r_s = \frac{W_s - W_{s-1}}{N\,(W_{s-1} + C_s)} \tag{6}$$

where: W stands for the average wages of those with educational level s or $s-1$; C_s is the annual direct social cost of school level s; and N is the number of years of study between school levels s and $s-1$.

The profitability or yield of investment in education is arrived at as for any other investment. Thus, in formula (6) the numerator shows the annual increment in earnings that is assumed for expository simplicity to be constant throughout the individual's lifetime, whereas the denominator shows the lump-sum cost of acquiring that level of education. Division of the annual benefit by the lump-sum cost has the same meaning as, say, a 5-per-cent yield arrived at by investing £100 and getting back £5 per year. Note that in the case of education, a substantial part of the cost is the forgone earnings of the individual while studying. The necessary information in this respect is:

INFO. 11

Pre-tax wages and salaries of employed persons by educational level

and

INFO. 12

The direct social cost structure of each level of education

It should be noted, however, that formula (6) is only an approximation given here to bring out the essential components of cost-benefit estimation. Refinements require the following additional pieces of information:[1]

INFO. 13

Age/earnings profiles by educational level

This information is necessary for correcting the previous expression for discrepancies in the lifetime shape of the earnings differential between the various educational groups.

INFO. 14

Shadow pricing of the different kinds of labour

This information is essential in case some severe discrepancies are

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[1] See G. Psacharopoulos, *Returns to Education; an International Comparison*, Elsevier, 1973.

> suspected between observed market wages and the true marginal social product of labour. The latter in turn can be approximated in two ways: (a) econometrically, by fitting a production function and differentiating it with respect to particular kinds of skills; or (b) by restricting one's observations of earnings to the competitive sector of the economy. The first way is rather difficult and has remained more or less an academic exercise.[1] The second way makes more sense in most practical circumstances and is strongly advocated here. Hence one should obtain INFO. 13 for the competitive sector of the economy and not by observing public sector salaries.

Another problem that arises in using observed earnings in rate-of-return calculations is that the earnings differential between successive school levels might be due to a host of 'other factors' as well, such as differences in intellectual ability or socio-economic background. The standard procedure is to adjust the raw-earnings data for differences in the 'other factors' by means of an earnings function of the type

$$W = (S, AGE, F, IQ, \ldots) \tag{7}$$

where the wage (W) of an individual is expressd as a function of his level of schooling (S), his age, certain family conditions (F) (perhaps father's occupation), his level of IQ and so on. Having estimated this function for a cross-section of individuals, one can construct predicted age/earnings profiles by level of education that are standardized for the 'other factors'.

Formula (7) requires having available:

INFO. 15

Micro-data on the personal and family characteristics of a representative sample of employed persons in the economy

The characteristics should include not only formal education, age, IQ and family beckground, but also the kind and the length of on-the-job training and occupation. Such cross-sectional or even longitudinal data in this respect have been in use for some years in educational planning.

It must be remembered, however, that even if one had perfect historical information on how people's characteristics have changed over time, this might not be fully appropriate for educational planning. Planning refers to changes at the margin, starting today.

A tendency has recently been detected in this field whereby information is raised regarding recent graduates of the educational system. Thus a planner may wish to have:

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[1] See G. Psacharopoulos, 'Estimating Shadow Rates of Return to Investment in Education', *Journal of Human Resources*, Winter 1970.

INFO. 16

A tracer study on the employment conditions and socio-economic background of recent graduates

Tracer studies are mainly concerned with the recent output of the educational system and the way this output fits the rest of society. For example, it may be that recent graduates of the school of architecture are unemployed for longer periods than other graduates and also receive lower starting salaries relative to the average university starting salary. Such information on the employment conditions at the margin (that is today or in the recent past) is vital for making decisions in education. It is certainly more appropriate than knowing the employment history of those who are aged 60 today and graduated from another kind of educational system, certainly of different quality, forty years ago.

A final remark regarding the cost-benefit model has to do with the private side of it. This is easier to estimate relative to the public side as the marginal product—observed wages discrepancy—is immaterial. Actually, one of the reasons for studying the private rates of return is to assess the private signal to which individuals respond in seeking different levels of education. Thus the private rates of return are closely linked to the social demand-aspect of educational planning. The estimating formula differs from (6) above:

$$r'_s = \frac{W'_s - W'_{s-1}}{N\,(W'_{s-1} + C'_s)} \tag{8}$$

where: W' stands for after-tax earnings; and C' for the private direct cost of education.

The difference between formulae (6) and (8) lies in the point of view from which the costs and benefits are measured. In the case of the private calculation, it is only the increment in after-tax earnings that matters. Also, it is only the after-tax earnings of the previous level of education that represent the opportunity cost. In addition, the direct cost of education is only what the individual pays out of his or her pocket in order to study at the given level of education, whereas in calculating the social rate of return, the direct cost represents the true social cost of, say, keeping one student for one year in a university institution. In order to use formula (8) one needs to know:

INFO. 17

After-tax earnings by educational level

The direct private cost of education is usually assumed to be equal to zero or to be simply cancelled out by part-time earnings while studying. For the private estimation, earnings data must include the public sector. The reason is that the civil service is an important employer of educated labour of all levels and thus its pay scales give the private incentive for people to seek particular kinds of education.

Information towards achieving equality and employment objectives

The bits of information listed so far may enable the planner to provide for adequate high-level manpower to achieve economic growth targets or to allocate the educational budget in an efficient way. However, he may wish to observe in addition to efficiency an equality objective. Equality in this context means two things: (a) equality of educational opportunity; and (b) equality of income distribution. For the first purpose the planner may wish to know:

INFO. 18

The distribution of the educational attainment of the population by socio-economic background and region
Attention is drawn here to the fact that the information on 'group disparities' pertains to the population as a whole, not only to the labour force as was the case with the traditional objective of efficiency.

INFO. 19

The entrance ratios of selected population groups to different levels of education
Is it true, for example, that selective university faculties recruit their students mainly from urban, well-to-do families? If yes, one might wish to institute a policy of opening up the university to other groups of the population so they may enrol in these faculties.

Information also becomes vital when the planner wants to assess the relationship between education and income-distribution in order to affect outcome disparities. The standard procedure is to relate the variance in earnings to the distribution of education:

$$\text{Var}(\text{Log } Y) = \text{Var}(S \text{ and related parameters}) \qquad (9)$$

where S is the number of years of schooling of the individual.

In other words, this formula relates the distribution of earnings in our society to the distribution of particular characteristics of individuals in the population. By applying the formula empirically, one can tell by how much education is responsible for the observed distribution of labour earnings relative to other factors. Again, the INFO bits listed earlier regarding the estimation of the private returns to education would be sufficient. The empirical aspect of formula (9) is currently widely debated in the literature.[1] Perhaps the planner would like to have the necessary data and see how the different models apply in his case.[1]

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[1] See C. Jencks *et al.*, *Inequality*, Basic Books, 1972.

There is a case, however, where new information might be necessary. When the income-distribution question is investigated in the context of a developing country where few people work for paid employment, one would like to concentrate on the poverty conditions of just a target group of the population. This amounts to approximating:

INFO. 20

Real-income measures of the lower part of income-distribution
This information ties in with the recent focus on basic needs and informal-sector employment conditions.

The employment objective is also in part (if not altogether) an income distribution objective. But whereas income maintenance via transfers might improve poverty conditions, the way some people acquire the cash payments they receive is also important. Thus, one would like to have data on:

INFO. 21

Labour-force participation and unemployment rates by level of education
A given educational policy will have a differential impact on the overall employment level if graduates of the various schools face different employment opportunities. This is something the planner wishes to know.

A final remark has to do with possible (if not certain) trade-offs between different objectives. For example, one can pursue the equality objective at the expense of some efficiency or vice versa.[2] An additional 'information' might be the value judgement or normative criterion of the ultimate deciding authority (i.e. the politician) on what has most value. The role of the technocrat planner is simply to serve to the politician the probable social consequences of alternative policy 'menus'.

The special case of developing countries

The last two pieces of information listed above raise the issue of the kind of country to which the information refers. In developed countries it is very likely that most of the information relevant to educational planning either exists already somewhere in the system or could be easily raised. In developing countries, however, not only the necessary information might be missing; the statistical infrastructure for raising it might be lacking as well. The situation is even more serious considering that it is these countries which are more likely to seek information related to educational policy for change.

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[1] For the relevant debate, see G. Psacharopoulos, 'Socio-economic Background, Education and Achievement', *British Journal of Sociology*, September 1977.

[2] For some actual estimates of this trade-off, see G. Psacharopoulos, 'Estimating the Welfare Effects of Educational Policies', in V. Halberstadt and A. Cuyler, *Public Economics and Human Resources*, Cujas, 1977.

Several of the following chapters contain proposals on how the flow of educational information could increase in the developing countries and elsewhere. I would like to mention at this point some differences in the kind of information needed by the two great categories of countries which make the situation look less bleak than it may appear to the casual observer.

In the first place, some of the information required in advanced countries might not apply to the others or apply only partially. For example, the occupation–employment matrix might be measurable only in the modern urban sector of a developing country.

What about the rural and informal sectors? Although a large amount of work is being carried out on this front, the immediate solution is the use of proxies for difficult-to-measure variables, e. g. one can approximate living standards by calculating employment-for-so-many-hours-per-year, rather than by income.[1]

Another difference in the nature of educational information required by the two categories of countries lies in the fact that the advanced countries have reached almost universel enrolments at the compulsory-education levels. Hence their planners focus attention on policy and statistics at the post-compulsory level. By contrast, the policy-maker's main preoccupation in developing countries is (or should be) how to enforce minimum-schooling legislation in the countryside. The required information in this respect goes well beyond education and economics, extending to social anthropology. Again, a substantial amount of work is taking place on this and related areas so that the information situation is not so desperate as the preceeding long list of INFOs might suggest.[2] In other words, the developing countries might be concerned with only part of the information listed above, although they have additional information requirements as outlined in the following chapter.

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[1] See A. Sen, *Employment, Technology and Development*, Clarendon Press, 1975, and S. V. Sethuraman, *Jakarta: Urban Development and Employment*, ILO, 1976.

[2] As an example of a research programme in this area cutting across disciplinary lines, I would like to mention S. G. Weeks' 'Youth in their Villages' conducted in Papua New Guinea.

3 The existing state of information systems

In the previous chapter I listed twenty-one concrete pieces of information an educational planner should have at his disposal as a minimum in order to carry out his task adequately. Most of this information is quantitative. In the following paragraphs, I try to bring in additional information, rather elusive to define, which the planner might wish to have. Later in this chapter I shall attempt to evaluate the state of the existing system of information exchange in the world arena of educational planning today.

Enlarging the information base[1]

Educational objectives are essentially of two kinds: education-centred and society-centred.

The first category relates to education as an end in itself, as has been the case heretofore and is likely to be maintained by the momentum of tradition and professional interest for some years to come in many developed and developing countries. The second reflects the notion that education is not a system, but rather a 'sub-system' aimed at enhancing more global objectives, some of which are relatively specific, such as economic growth, employment and income distribution, while others are still generically grouped under the heading of 'quality of life' and refer to health, nutrition, environment, job satisfaction (as opposed to 'productive' employment), and so on.

Education-centred objectives, by definition, must aim at educational equalization and therefore be served by information which will discriminate data according to population groups and groupings by age, ethnic group, religion, sex, socio-professional category or origin (for children and youth), and by region or sub-region (urban, rural, semi-urban, etc.) within each country. Most of the information necessary for satisfying these objectives has been listed in the previous chapter.

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[1] This section draws from H. Reiff, 'Thoughts on Educational Models, Indicators and External Assistance', Paris, Division of Educational Policy and Planning, Unesco, 1975 (Reports and Studies, S. 19).

Societal objectives, however, embrace additional indicators such as: acceptance of population policies; health standards; nutrition standards; mode of life measured against environment; use of mass media; community action.

Rather than indicators, some of them resemble more abstract notions than detailed quantitative statistics. Some of them overlap with basic needs, others with participatory and intersectoral planning.[1] These areas become even more elusive to define in a concrete way when examined in the global context of decision-making in education (see Fig. 3.1 below).[2]

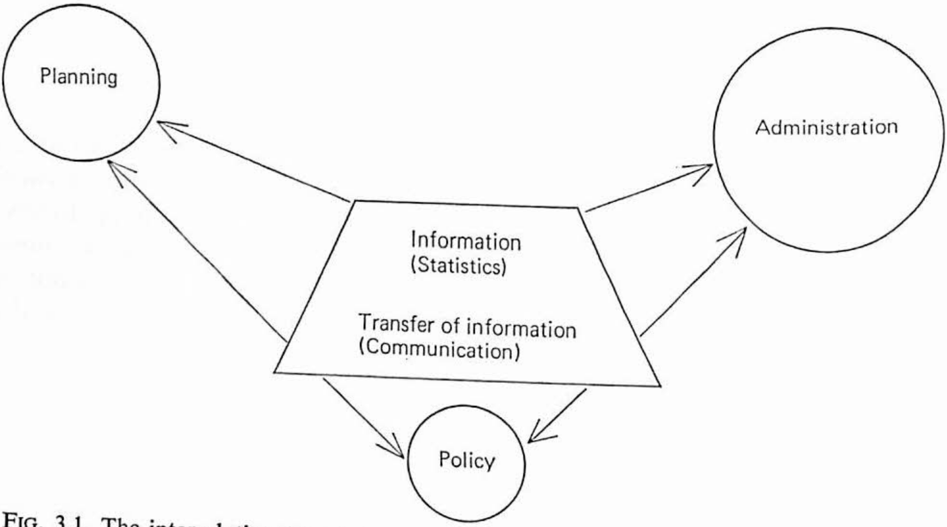

FIG. 3.1. The interrelationships between information and decision-making in education.

Statistics are only one part of the information and communication network which integrates the functions of the decision-making process in education (i.e. policy, planning and administration). Since policy-makers in the field of education do not base their decisions on planning models alone but on all types of quantitative and qualitative information available, one must widen the concept of 'statistics for educational planning' to include all quantitative and descriptive information which could be helpful in the development of innovative decisions in education.

The key word here is 'innovative' as opposed to 'routine' decisions relating

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1. For the treatment of these 'new' topics in educational planning, see: OECD, *Participatory Planning in Education*, 1974; OECD, *Intersectoral Educational Planning*, 1977; R. Carr-Hill, 'Education and Basic Needs: Views on Concepts and Measurement', Paris, Division of Educational Policy and Planning, Unesco, 1978 (Reports and Studies, S. 54); R. Carr-Hill, 'Participatory Planning in Education: Testing Some Concepts', Paris, Division of Educational Policy and Planning, Unesco, 1976 (Reports and Studies, S. 15).
2. See K. Hüfner and R. van Gendt, 'Towards a New Theoretical Frame-work in Educational Planning', OECD/CERI (mimeo.).

to fixed programmes. The information listed in Chapter 2 was conditioned by past practices when statistics for planning reflected traditional formal structures and functions of 'school education'. The use of such data enabled planners to appreciate the consequences of the system but offered no clue to innovative programmes in educational development. Planning educational 'futures' requires information systems which go beyond statistics to meet routine operational needs. Such information systems have to serve the exploration of alternative long-term strategies, the evaluation of policy and programme implementation, and the integration of policy planning and administration.

In this connection, it is necessary to aim gradually at developing the statistical support of two important links between planning and decision-making in education and the real world: (a) the linking of the results of systematic analysis, forecasting, programming and evaluation of the educational system to policy formulation; and (b) the linking of demystified teaching/learning relations (the instructional process) to their macro-consequences: aggregate educational plans and programmes.

Most objectives pursued by educational policy are not end-objectives but serve as inputs to wider societal objectives. It may be observed that in most developing countries the highest level of decision-making in education lies largely outside the educational sector and institutions. It is usually a central planning office that formulates the goal areas relating to the economy (education for skilled manpower) while educational goal areas like 'democratization' or 'equalization of education' or 'quality of life', which are often derived from the constitution and basic laws of the country, are hardly ever translated into operational sub-objectives. In most instances, the only goal area in which the Ministry of Education does set any quantitative targets relates to enrolment targets, which may be translated politically into 'satisfying the aggregate private demand for education'.

As a consequence of the above practice, in most developing countries we find that educational programmes are mainly a function of the latter objective, sometimes corrected at the upper secondary level by considerations of skilled manpower formation for economic growth. Therefore, the major questions to consider are, first, how to correct the direction of educational programmes to take care of objectives outside the goal structure which is oriented purely to 'economic growth' and 'demand for places', and, second, how to develop quantitative information systems which would allow for such a correction.

When looking into this matter, it becomes evident that the data needed for this purpose, namely statistics to construct educational performance indicators outside the purely occupation/manpower framework, are not easy to find. Conversely, statistics on inputs into formal school education (pupils, teachers, finance, etc.) and scholastic processes (flow and transition data, drop-outs and repetition, examination results, cost per graduate, etc.) have been relatively well developed. Since a correction in educational policy requires a feedback of qualitative and quantitative information on the system's performance to the various levels of decision-making, it may be useful to indicate what kinds of concrete information could be identified for this purpose.

Some additional pieces of information

Let us start from an area that lies between the traditional and modern era of educational planning: school achievement. It has been recently recognized that the determinants of performance at school (as measured perhaps by grades or marks) do not depend only on school inputs: family and other environmental characteristics play an important role.[1] In order to fit an 'educational production function', as this area of research is commonly known, one needs:

INFO. 22

Data on school and family inputs in relation to the scholastic achievement of schoolchildren
The analysis of such data can be used for policy purposes in order, say, to compensate for the poor performance in school of children of a particular socio-economic group. School performance is ultimately related to success later in life. Therefore this kind of information can be linked to many modern educational goals like basic needs.

Lifelong education is also a modern educational goal. The extent of it could be measured by:

INFO. 23

Adult participation rates in formal educational activities
The extent of informal education is very difficult to track down tries where adults participate in literacy programmes.
A related bit of information is:

INFO. 24

Distribution of informal and non-formal education by population groups
The extent of informal education is very different to track down because it refers to all sorts of learning-by-doing activities or learning simply by living in a given environment. The extent of non-formal education, however, can be measured as it refers to organized learning outside the school system. A typical example of non-formal education in developing countries is perhaps the short courses given by agricultural extension officers to local farmers.

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[1] For controversial findings in this respect in advanced countries see Jencks, op. cit., and J. Coleman *et al.*, *Equality of Educational Opportunity*, U.S. Office of Education, 1966. For a review of findings in developing countries, see J. Simmons, 'The Determinants of School Achievement in Developing Countries: the Educational Production Function', International Bank for Reconstruction and Development, (Bank Staff Working Paper No. 201), March 1975.

Another indicator, the knowledge of which could serve modern educational objectives, is:

INFO. 25

Educational disparities between parents and teachers (formal subsystem) and between trainees and trainers (informal subsystem)
This measure is particularly important given the fact, known from research in educational production functions, that the parent contributes significantly to the absorption of the school curriculum by the child. Too much difference in educational attainment between parent and teacher means that the former cannot effectively help the latter in his role of transmitter of knowledge.

Regarding the drive towards democratization of the school system in general, the following piece of information could reveal a possible area for policy action:

INFO. 26

The actual degree of transferability between different curriculum streams of the educational system
The example *par excellence* in this case is the possibility (but at what private cost?) for children who have followed secondary level technical subjects to move to another type of curriculum at the secondary or post-secondary level. This is not only an equity-democratization issue: it also touches upon efficiency, since the more flexible the transferability between curriculum areas, the later specialization takes place and thus the faster the impact of a given policy can be felt.

Finally, the last concrete piece of information advocated here is:

INFO. 27

Information feedback from the labour market to the student and his family
When such feedback is organized, it encourages the involvement and participation of all those concerned with education, i. e. parents, students, teachers, employers, and the central authorities. This sort of information could take the form of vocational guidance. It also includes the open expression of students' preferences, which serve as a record and feedback to the Ministry of Education of the social acceptability (or possible failure) of its own policies.

Some actual educational problems in today's world

Before attempting an evaluation of the existing state of information systems, we should consider a few contemporary educational problems different countries face.

At the international level, Unesco's Medium-Term Plan (1977–1982) contains some real challenges to educational planners. The main features of the plan are:

The awareness of the multiplicity of internal and external economic and social factors which intervene as constraints in the planning procedure.
The desire for a global approach to planning, encompassing the formal school system and out-of-school activities, and considering employment requirements and the social demand for education.
The particular emphasis given to the rural areas where the majority of the world's population is concentrated.
The promotion of the endogeneity of educational development.[1]

At the country level, the papers in Part III of this book and four Unesco surveys of educational plans in Asia, Africa, Latin America and the Arab States contain plenty of examples of actual educational policy problems countries face.[2] Some common trends across countries could be summarized as follows:

Extension of compulsory education (as in Malaysia).
Preoccupation with quantity imbalances of educated manpower (as in Poland).
Social acceptability of rural education programmes (as in Upper Volta).
The trade-off between free education and fees for improving quality of education (as in Thailand).
The provision of more classrooms (as in Afghanistan).
The immediate relationship and applicability of education to local conditions (as in Bhutan).
Educational experimentation via pilot projects (as in Indonesia).
The preservation of the basic national ideology (as in Pakistan and Nigeria).
The improvement of the quality of teachers (as in Ghana).
The combination of work and study (as in Cuba).

Every single one of these educational problems requires the policy-maker to have enough 'information' (as defined earlier) for a base on which to proceed. So we now address ourselves to the present state of the information system, starting with the sources.

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[1] See Unesco, *Medium-Term Plan* (1977–1982), 1977, p. 151–2.

[2] See the following, all published by the Division of Educational Policy and Planning, Unesco: 'Educational Policies and Plans in Asia in the 1970's: Summaries and Synthesis' (assisted by Mr S. Lingappa), 1977 (Reports and Studies, C. 46, mimeo.); 'Educational Policies and Plans in Africa in the 1970's: Summaries and Synthesis' (assisted by Mr H. Wolde Selassie), 1977 (Reports and Studies, C. 54, mimeo.); 'Politiques et Plans d'Education en Amérique Latine dans les Années 70: Résumés et Synthèses' (assisted by Mrs V. Mizon), 1977 (Reports and Studies, C. 53, mimeo.); 'Politiques et Plans d'Education dans les États Arabes dans les Années 70: Résumés et Synthèse' (assisted by Miss A. Bouaoula), Reports and Studies,C. 55 (mimeo.).

The sources of information

There exist basically two sources of information where one can find material related to educational policy-making: (a) published sources (including computer storage); and (b) unpublished sources. Books on monographic topics; or statistical data are probably the most common sources (items 1 and 3 in Taxonomy 3.1). Specialized journals can be divided into two groups: those addressed mainly to an élite, highly technical audience (like the *Journal of Political Economy* or the *Journal of Human Resources*) and those that are likely to have a more immediate impact on the educational policy-maker, who is not always interested in the technical analysis behind the conclusions (i.e. something like Unesco's *Prospects* or the *International Review of Education*). Newspapers also include a great amount of information for educational policy-making, such as reports on social reactions and attitudes towards educational matters. For example, in Thailand public opinion as expressed in the newspapers was influential in not raising tuition fees to improve the quality of education (see the Thailand case-study in Part III, below).

A great deal of information related to educational policy-making is often found in obscure mimeographed papers, written perhaps on the occasion of a consultant's visit to country X or submitted to a university faculty as a Ph. D dissertation. These sources of information are difficult to locate, yet they often contain important material. Also, beyond what is reported in a national newspaper, there exists a lot of further feedback one could get from local schools, parents and teachers, but much of public opinion regarding attitudes towards the state and change in education goes unrecorded. For example, the Upper Volta case-study (Part III, below) reports that when preparing the programme of rural education, the planner wished to have information on the following question: 'Would you be prepared to send your son to a rural education centre?'

TAXONOMY 3.1. Information sources

A. *Readily available, published material*
  1. Monographic studies
  2. Journals:
    (a) élite, highly academic
    (b) applied, layman coverage
  3. Census or other statistical publications:
    (a) government
    (b) university or individual researchers
  4. Newspapers

B. *Unpublished material*
  1. Case-studies in mimeographed form
  2. Preliminary results of ongoing research
  3. Students', parents', teachers' and employers' opinions

The way the information flows

Taxonomy 3.2 presents a classification of the most common methods by which information moves from the producers to the users. Category A is the case where the producer is at the same time the user of the information. An example might be research conducted within the Ministry of Education itself on the social and economic consequences of contemplated legislation to raise the minimum school-leaving age by two years. Alternatively, the interested body (i.e. the Ministry of Education in this case) might commission this kind of investigation from an outside research institution. This is a common case as ministries usually lack the appropriate personnel for in-depth investigation of particular aspects of the educational system. The category does not, of course, pose any special problem of information channelling from the producer to the user. However, it poses a problem as to whether other potential users, domestic or foreign, know of the existence of such research results which could help them solve their own problems.

This remark brings us to category B, where the user does not have the time, the financial resources or even the know-how to generate its own research results, and therefore turns to libraries, data banks or advisory services to obtain the required information. The form of the information request and supply varies, e.g. a computer printout of the literature or a list of what other countries are doing on the given subject. The user may turn to the Educational Resources Information Center (ERIC) or BIBLIO computerized reference services or to the non-computerized IBEDOC service of Unesco's International Bureau of Education (IBE). The latter, for instance, receives about two major requests per week from countries at all levels of development asking for information on matters ranging from school mapping and transportation to the application of new media in parents' education programmes.

TAXONOMY 3.2. Information channelling

A. *By absorption of own research results*:
   1. Generated within the institution concerned
   2. Specially commissioned to an outside research body

B. *By active request addressed to*:
   1. Libraries
   2. Data banks
   3. Advisory services

C. *By passive or active participation in*:
   1. Information networks
   2. Specialized meetings

D. *By accidental exposure to*:
   1. Printed material
   2. Social pressure groups

Category C in Taxonomy 3.2 does not involve much action from the participant. He may simply belong to an informational network that deals with matters of interest to him, such as the now extinct Programme in International Education Finance based at the University of California at Berkeley,[1] or the newly created Vienna-based European Association of Development Research and Training Institutes (EADI).[2] Or he may participate in a seminar, workshop or conference on the subject. Meetings organized by international organizations are typical in this respect: although an official may not be specially interested or need information on a particular subject, he may be sent by his superiors to attend such a meeting on behalf of the country. Despite such non-active participation, the meeting might have an informational impact on the official if he absorbs, aven subconsciously, an idea, concept or research result that is applicable to the problems facing his country.

The last category, D in Taxonomy 3.2, includes all informal exposures to information that do not originate from a particular request by the potential user. For example, simple subscription to IBE's *Innovation* bulletin might provide insights to a particular policy-maker. Even a student or parent demonstration outside the Ministry of Education could be an important piece of information to him.

Identifying the information gaps

Having gone through the sources of information and the way this information flows from the producers to the users, let us undertake a critique of the existing state of affairs. This will be done by pointing at specific gaps which, in my opinion, exist in the informational production-flow circuit.

INFO. GAP 1

The educational decision-maker is not aware of existing information that might help him in his decision

I would like to argue that the primary informational gap in this area is due to inadequate dissemination of existing ideas or data rather than the lack of new statistics. For example, when a politician is about to make a decision to construct a new university, he might not be basing it on full knowdlege of the available information somewhere else in the system. Perhaps information exists somewhere to the effect that a rise in the minimum school leaving age would have a probable effect on improving income distribution by 10 per cent relative to its present state, whereas the effect of another university might be to worsen income distribution by 15 per cent. We keep saying that education reforms are political

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[1] For a description see the article by R. Pritchard in Chapter 15 below.

[2] For a description see H. P. Nissen, 'Towards the Formation of a European Working Group on Income Distribution Research', EADI, 1978 (mimeo.).

> acts. Yet I would like to maintain that if politicians were exposed to fuller information statements as in the hypothetical case presented above, they might arrive (or be obliged to arrive) at a different decision.

The reasons why educational decision-makers are not always well informed about existing information can be traced back to another gap in the flow of information:

INFO. GAP 2

The technocrat who advises the educational decision-maker might not himself be informed of existing research results that might affect his recommendation

What is the reason most of the newly independent countries in Africa have expanded their university sectors much faster than primary education? Probably, the technocratic advice that high-level manpower allegedly is needed for economic growth strengthened the politician's desire to increase university enrolments for socio-political reasons. Yet, the technocrat's view is a mistaken one. Had the person giving this recommendation been aware of some existing information, he might have advised the minister to take a different course of action. For it was well known in some quarters at the time that the expansion of primary education is more likely to boost economic growth than would the expansion of universities. Obviously, there has been some communication gap between the decision-making process and existing information that might have helped the policy-maker to arrive at the right decision. To put it bluntly, manpower forecasting of the traditional type is still today widely applied throughout the world in spite of the fact that there exists strong evidence that it may lead to the wrong decision, i. e. it may not serve the purpose for which it is applied.

The reason for INFO. GAP 2 can be traced in turn to another gap:

INFO. GAP 3

There still exists a great distance between the producers of educational information and the users

The users are politicians, administrators and their advisers. The non-overlapping producers are the people in the academic research community, the teachers, the parents and the students themselves. How well do these groups communicate? Not well at all. Research results produced by the academic community either are not well explained in an understandable way to administrators or they are dismissed as 'academic exercises'. The statement that academics sometimes produce academic exercises is absolutely true, although one may question the meaning of an 'academic exercise' and perhaps argue that this is exactly what the academic research community should do. But on the other hand, there exist some solid pieces of information, originally derived by the academic community, that continue to be ignored by educational planning practitioners. As the best example of this gap I have chosen the continuing application of manpower forecasting.

There are in turn several reasons why the above gap exists:

INFO. GAP 4

There is a great gap in the translation of research results from élite journals to the media educational planners consult

Administrators speak a different language than do researchers. Technocrats employed by the Ministry of Education speak a different language than do technocrats in research institutions. The two groups often read different journals. The interaction between the two species is often minimal.

I am not referring here to some off-beat research result, obtained using a maximum likelihood procedure or three-stage-least-squares approach, that appeared in the *Journal of Political Economy* and never reached the educational decision-maker in Papua New Guinea. I am referring to the huge amount of printed (although usually mimeographed) material that is produced in countries like Papua New Guinea and never reaches the author of the article that appears in the élite journal. Yet the two parties would greatly gain if the distance that separates them was somehow reduced.

One reason for the existence of such distance is:

INFO. GAP 5

The user's incentive for assembling up-to-date information is sometimes lacking

It is a well-known fact that administrators in the public sector do not have as many incentives as their counterparts in the private sector for optimizing their behaviour. Collection and assimilation of information is costly, if nothing else, in terms of time and effort. Moreover, the reward for being fully up to date regarding information that affects them is not always very clear. Perhaps loss of office would be a possible threat (i.e. the equivalent of takeover in the case of inefficient managers of large corporations) which would provide an incentive to be better informed.

This brings us to more conventional gaps in the flow of information such as:

INFO. GAP 6

There are important lacunae in existing information networking facilities

As these networks are explained at length by individual authors later in this volume, I will offer here only a succinct summary along with my own view on the subject:

Libraries holding published material contain as a rule outdated information. Journal articles are on the average two years obsolete by the time they appear in print.

Computerized bibliographical services are quick in drawing up lists of references on a given topic but they are limited to what already exists in the computer.

Advisory services are good regarding contact with the user but are also limited by what the advisers on the spot know.

Official networks sound very good on paper and give an excellent public relations service. However, I have strong doubts about their actual effectiveness. Sometimes their members are not interested in participating in them.

Informal networks (of the old-boy or fellow-researcher type) are, in my opinion, the most effective in disseminating information relating to educational decision-making. Unfortunately, the actual users of such information seldom use this approach. Instead, they may resort to official advisory services or consult computerized bibliographical centres that contain obsolete information.

Meetings (such as conferences and seminars) are in my opinion very effective in disseminating up-to-date information of interest to educational decision-making. Unfortunately, such meetings are usually polarized in the sense that they are attended either by practitioners (users) or by researchers (producers). The two species seldom get together.[1]

INFO. GAP 7

There are significant lacunae in bottom-up, region-to-centre and South-North information flows

This gap refers to the modern, often ill-defined (although politically popular) conceptions of educational planning. It is now commonly felt that information should flow also from those who are subjects of planning to the planners, from the local districts to the centre, and from one developing country to another without advice from the 'North'. Although I sympathize with this intention and would encourage information flows in these directions, I would not pursue them to the point of giving them priority at the expense of the other, more identifiable and concrete gaps cited above.

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1. For an exception, see the *Proceedings of the Inter-agency Seminar on Education, the Nature of Work and Employment*, organized by the IIEP, 5–9 December 1977.

Given unlimited resources and time, one of course would like to increase the flow of information in all directions, but in view of time and budgetary constraints, one should give more priority to some kinds of flow and less to others.

INFO. GAP 8

Existing information for educational decision-making is extremely unbalanced

Data on enrolments, labour-force particiation and OCC–ED matrices are well developed. On the other hand, data for evaluating the output of the schools are very scanty. In my opinion top priority should be given to obtaining information on the employment conditions of graduates. As of today, information on this topic is largely impressionistic.

INFO. GAP 9

The content of the international exchange of information related to educational decision-making leaves much to be desired

A considerable amount of information related to educational planning moves across borders. Some of it changes hands between individual researchers or research institutions. Another part takes the form of statistics or meetings held by international organizations. I would like to argue that the amount of this international information flow is vast. However, this information might be only remotely related to what the user really needs for making a decision in education.

The role of international organizations in this respect is examined in the next chapter.

4

Some proposals for the future

In the previous chapters, I have tried to put some bones into the amorphous notions of 'information' and 'networking'. The result is a list of specific informational bits the educational decision-maker should have at his disposal and which can be summarized as follows:

INFO. 1	Past demographic trends and projection of the number of births for some years into the future
INFO. 2	Enrolments by individual grade (or class) and age for some years in the past
INFO. 3	Migrations of school-age population in and out of the country or region where the projection takes place
INFO. 4	Student aspirations by region, socio-economic group and household composition
INFO. 5	The three-dimensional cross-classification of the labour force by sector of economic activity, occupation and education
INFO. 6	The most likely or the target sectoral growth of output
INFO. 7	The likely future movement of productivity for each occupation and economic sector
INFO. 8	The formal educational content of each occupation
INFO. 9	Data on the OCC–SEC–ED distribution of the labour force in other countries
INFO. 10	Pairs of relative wages and relative skill utilization in a number of firms
INFO. 11	Pre-tax wages and salaries of employed persons by educational level
INFO. 12	The direct social cost structure of each level of education
INFO. 13	Age/earnings profiles by educational level
INFO. 14	Shadow pricing of the different kinds of labour
INFO. 15	Micro-data on the personal and family characteristics of a representative sample of employed persons in the economy
INFO. 16	A tracer study on the employment conditions and socio-economic background of recent graduates
INFO. 17	After-tax earnings by educational level
INFO. 18	The distribution of the educational attainment of the population by socio-economic background and region

INFO. 19 The entrance ratios of selected population groups to different levels of education
INFO. 20 Real-income measures of the lower part of income-distribution
INFO. 21 Labour-force participation and unemployment rates by level of education
INFO. 22 Data on school and family inputs in relation to the scholastic achievement of schoolchildren
INFO. 23 Adult participation rates in formal educational activities
INFO. 24 Distribution of informal and non-formal education by population groups
INFO. 25 Educational disparities between parents and teachers (formal subsystem) and between trainees and trainers (informal subsystem)
INFO. 26 The actual degree of transferability between different curriculum streams of the educational system
INFO. 27 Information feedback from the labour market to the student and his family

The identified gaps in the process of information generation and transmission are summarized in the following list:

INFO. GAP 1 The educational decision-maker is not aware of existing information that might help him in his decision
INFO. GAP 2 The technocrat who advises the educational decision-maker might not himself be informed of existing research results that might affect his recommendation
INFO. GAP 3 There still exists a great distance between the producers of educational information and the users
INFO. GAP 4 There is a great gap in the translation of research results from élite journals to the media educational planners consult
INFO. GAP 5 The user's incentive for assembling up-to-date information is sometimes lacking
INFO. GAP 6 There are important lacunae in existing information networking facilities
INFO. GAP 7 There are significant lacunae in bottom-up, region-to-centre and South-North information flows
INFO. GAP 8 Existing information for educational decision-making is extremely unbalanced
INFO. GAP 9 The content of the international exchange of information related to educational decision-making leaves much to be desired

Our task in the present chapter is to discuss a few operational alternatives that might help the process of *relevant* information generation and *effective* dissemination. Beyond relevance and effectiveness, additional criteria should be *concreteness* and *cost*. Let me spell out what is meant by each of the above-listed properties of information generation and exchange.

Relevance means producing or transmitting the kind of information the educational decision-maker actually needs and not just what the producer can offer. For example, another enrolment projection might be easy from the producer's point of view. However, this kind of information might be of little relevance to the educational decision-maker who wants to enact a policy to reduce youth unemployment. Instead, he needs to know how quickly the labour market absorbs the graduates of different schools—not what the enrolment will be in a given faculty in the year 2000.

Effectiveness means that the relevant information reaches, in the shortest time possible, the person who can use it. For example, the relevant information might be broadcast to a group of people, yet the person really interested in it may not be exposed to the information, particularly if the person himself does not have the incentive actively to look for such information. Therefore, one property that an information system should have is to provide or stimulate the incentive of the user to seek information.

Concreteness means that the information to be produced or disseminated refers to specific items in the educational decision-making process, like the ones listed above. A network 'to disseminate information' means nothing. The information to be disseminated should be made as concrete and explicit as possible.

Cost. Of course one could devise a system by which those who are likely to benefit from the information are identified and matched to the producers. However, one has to consider the cost factor involved. Cost-benefit analysis cannot be applied in this case: whereas the cost can be identified, the benefit cannot. Clearly, a cost-effectiveness approach can be applied where a target is set (e.g. information X reaching user Y) and the different alternatives are costed.

The two major alternative routes

In thinking about possible solutions to improve the present state of information dissemination and exchange, two routes could be followed. One is to suggest marginal improvements (or even drastic ones) to existing modes of information dissemination and exchange. The second route is to try to conceive of a new system that might be more responsive to the present and future needs of educational decision-makers.

I am inclined to take the second route for the following reasons. I consider that the present system has failed to transmit relevant, concrete information in a cost-effective way to those who really need it. Journals are slow and polarized. Advisory services are limited by the quality and knowledge of the advisers. Data banks are quickly outdated and are costly. Libraries, especially of the computerized style, are slow and contain outdated information because they are also limited by what has been put into storage and how often it is updated. Broadcast services are perhaps cheap to run but cannot stimulate the reception incentive at the other end. And 'networks' are so vague that it is better to strip them down into what each one is actually doing before commenting on its efficiency; stripping down a 'network' usually reduces it to one of the activities listed above.

I find it difficult to suggest improvements to existing networking activities that would lead to increases in what I call relevant and concrete information to educational decision-makers. When the rhetoric is removed from the vast literature in this area, one is left with a vaccum as to what exactly could be done and how the situation could really improve. Therefore, I am inclined to put forward another proposal that goes beyond the existing ones and is also international in character. The essence of the proposal is that information exchange take place during short meetings between interested parties under the auspices of a mediator. This system of information exchange might be named 'International Educational Information System' or EDINFO for short. Its properties and proposed *modus operandi* are discussed below.

EDINFO

It is my opinion that the most effective way of exchanging information is a meeting between interested parties. The information that flows during such a meeting is necessarily up to date. Even if a manuscript or progress report is not available, the 'producer' or 'informant' can always give an oral presentation of the main results or the kinds of problems faced. This information is easily absorbed by the other participants since the transmission does not depend upon reading a text. A document could also be distributed during the meeting for later consultation. The information would be provided at low cost since there is no broadcast material involved and consequently no waste. The major part of the cost of the EDINFO system would be travel and *per diem* payments.

Obvious questions that arise are: Who will convene such meetings? Who will attend them? Where and how often will they take place? How long will they last?

The convener should be an internationally acceptable body so that as many countries as possible may participate in the scheme. It would be the responsibility of the convener to identify: the theme of a given meeting, the interested parties to be invited from a number of countries and a mediator to organize and guide the meeting.

The theme would be determined by the convener, probably in consultation with the participating countries, and should relate to a problem which is facing a number of countries and which would benefit from an exchange of updated information.

Invitees could be divided into two groups: those from countries that are already experienced in the theme area and those from countries that could (or should) benefit from the experience of the former group. The list of invitees should be drawn up in consultation with recognized experts and scholars in the theme area. For the first group of invitees, only persons having intimate knowledge of the theme should be included. The number of invitees should be limited so that the number of actual participants in the meeting, including the mediator, does not exceed an absolute maximum of twenty. Beyond twenty participants, communication becomes difficult.

Regarding the venue of EDINFO meetings, I suggest that initially they should be held in cities in the advanced countries. After a few trial meetings and after the 'debugging' of the information flow procedure used, the venue could be shifted to the capital cities of developing countries. This should prove popular with them, as they would then have the satisfaction of exchanging information among themselves rather than having information dictated from the North.

The frequency of the meetings is something that cannot be decided beforehand. It is a pragmatic question. Ideally, meetings should take place when the convener feels that a breakthrough has taken place in a given theme area or that country X has something of value to demonstrate to countries Y and Z. The meetings should not be institutionalized with set themes and set dates because they would become boring and lose their potential impact. Each meeting should be short in duration, say two days. This would help keep the discussions from dragging on into irrelevance and would hold the *per diem* cost to a minimum.

The role of the mediator is crucial to the success of the proposed EDINFO system. Of course he or she should be an expert in the field to be discussed and should be fully informed on the state of the art of the specific theme of the meeting in order to guide the discussion effectively. Careful preparation must precede each meeting, otherwise two days could easily be consumed by discussions on international politics or by exchanges of slogans, empty of any real content. Such discussions would be useless for all concerned.

Local production of information

The scheme put forward above refers to information exchange. A parallel activity that should be encouraged is local production of educational information. A country cannot always rely on another's experience. It must also generate original pieces of information pertaining to its specific conditions. Part of the role of EDINFO meetings would be to give the signal to the participating countries on what sort of information to raise. The kind of information needed is not to be dictated *ex cathedra* by the convener or mediator. It is to be discovered by the participants.

The production of educational information within a given country can occur in two places: first, at research institutions, university departments or organizations, and second, in the immediate environment of the educational decision-maker. It is my belief that absorption of information is more immediate in the latter kind of locus. As mentioned earlier there exists a huge commumunication gap regarding research carried out in university departments and the absorption of the results of such research by the policy-makers, even if the research refers to their most immediate interests.

What I would like to advocate is more research and information generation within the policy-maker's environment. If the production of some kind of of information (e.g. a survey of unemployed graduates or the construction and testing of a behavioural model on the motives behind the social demand for education) is beyond the capacity of the policy-maker's own institutional setup, then all or part of the work involved could be relegated to outsiders. However, the ultimate control should be in the educational decision-maker's hands, as this is the only effective way of utilizing relevant concrete information for the purpose of his decision.

Conclusion and appeal for a pilot EDINFO meeting

What I hope to have done in the introductory part of this volume is to discuss some specific kinds of information and to criticize the way this information is produced and disseminated in today's educational planning circles.

To summarize the main points put forward:

The whole area of information in educational decision-making is vague; the main ambiguity is what sort of 'information' one is or should be concerned about.

When specific bits of 'information' pertaining to educational decision-making are identified and made concrete, one sees major gaps in the following areas: lack of knowledge about existing information applicable to a decision-maker's needs; failure of existing 'networks' to transmit relevant information in an efficient and quick way; failure to translate and link modern educational goals to operational information pieces.

The last gap is perhaps the most difficult to deal with in the short run. The field of educational decision-making has not yet been developed to the point of incorporating, in an operational way, modern goals into action. This is something an international body can do very little to help. However, it could act on the first two gaps listed above. I have suggested that such action should deviate from the traditional and a new scheme be tried. The scheme would involve the international body, as a catalyst, bringing together producers (or owners) and users of educational information.

PART II

INFORMATION AND DECISION-MAKING IN EDUCATION: COUNTRY CASES

5

Algeria

Bouzid Hammiche

Introduction

In Algeria, as in most countries which have decided that their economic and social development must be systematically planned, the education and training system is regarded as a tool at the service of society as a whole and an instrument for achieving intermediate objectives such as the training of qualified senior personnel, scientific and technical development, raising the nation's intellectual standard, the creation of independent bases of intellectual development, the development of citizens' individual aptitudes, individual development and advancement without sex discrimination, modernization of the traditional rural sector and research for peace and progress.

Physiognomy of the educational system

Education, in the strict sense of the term, comes under two ministries: the Ministry of Education and the Ministry of Higher Education and Scientific Research. In addition, most of the other ministries have varying degrees of responsibility with regard to education and particularly with regard to vocational training.

Since the remodelling of the higher level in 1971 and that of primary and secondary education in 1976, the educational system may be divided into four levels.

Preparatory education lasts one or two years for children who are not yet 6 years of age. Basic education lasts nine years and is for young children and adolescents between the ages of 6 and 16. Secondary education lasts an average of three years and consists of three different streams: general education leading to the *baccalauréat*, technical and vocational education leading to the technical certificate and specialized secondary education for high-performance pupils. Higher education lasts from four to six years, depending on the branch or speciality, and leads to professional employment or initiation into research. University studies as such lead to the award of a degree or a State diploma.

Extramural education is for young people not in school and adults in jobs. Two independent national establishments were set up in 1964 and 1969 respectively: the National Literacy Centre, responsible for producing curricula, training staff and giving lessons by the functional method for workers in firms and by the mass method for other types of adult, and the National Centre for Generalized Education for young people not at school and also for pupils attending school to help them prepare for general education examinations by following courses by correspondence, radio and television. Vocational training is organized in each firm as a normal facet of production activities; the initiative comes from the various technical ministries and the Ministry of Employment. Vocational training of workmen and technicians takes place in practical teaching conditions that vary considerably with sector, branch and even speciality. The training or apprenticeship cycles and courses last from nine to thirty months in independent centres or in educational and training establishments mainly serving other purposes.

QUANTITATIVE DEVELOPMENTS

Quantitative growth, supported by a substantial effort in the form of the building and provision of facilities and recruitment of a large staff, has enabled the enrolment rate to be raised swiftly, regional disparities to be evened out and the basis for the training of senior personnel to be developed in the secondary and higher levels.

QUALITATIVE DEVELOPMENTS

With the structural modifications and changes in educational contents, Algerian education immediately after independence received a number of stimuli designed to reorganize the situation and facilitate educational change, thus preparing for the more radical changes that took place in 1971 and 1976.

Preparations for reform at the primary and secondary levels were aimed primarily at improving educational infrastructures in the following ways: standardization of course length; standardization of buildings and facilities; production of school manuals; development of school canteens; development of cultural and sports activities; and the double-purpose principle for intensive use of classrooms.

The reform of higher education undertaken in 1971 put into practice the new conception of the university's role and obligations. Breaking away from earlier practice and in particular from the organization of the university into four faculties, the Ministry of Higher Education and Scientific Research proceeded to set up a number of institutes in each university dispensing instruction to specific student streams on a modular basis, the courses being split into semesters. Accordingly, the following measures were taken: organization of the universities and institutes; modularization of education; organization of research; social action in the university; and development of cultural, sports and political activities.

ADMINISTRATION OF EDUCATION

The administration of education has been set up with the twofold object of ensuring that the local communities participate in the development of the sector and that teaching procedures and the programmes for each level of education are unified throughout the national territory.

At the *national level* the Ministry of Education and the Ministry of Higher Education and Scientific Research are responsible for developing national policy on education. In conjunction with the Ministry of Finance and the Central Planning Agency, they draw up and implement programmes on facilities, grant the establishments for which they are responsible the finance they need to operate, and ensure that activities are inspected periodically.

At the *provincial level*, Algeria is split up into thirty-one *wilayate* or territorial divisions equivalent to *départements*, and each *wilaya* has a people's assembly with voting rights and an executive council. One of the members of this council, which is presided over by by a *wali* (previously the *préfet*) who represents the central government, is a director of education with particular responsibility for operations in the primary and secondary levels and extramural education.

At the *local level*, whereas for higher education the structure of responsibility does not include any intermediate level between the central administration and the university rectorate, establishments at pre-university level come under a relatively complicated teaching and administrative supervisory system in which the 1976 reform has so far made little change.

The elementary schools, whose combination with the intermediate education colleges is to lead to the setting up of basic schools, do not have the status of independent public establishments. Operationally, they depend on the local authority for expenditure on materials and maintenance and on the Ministry of Education for staff remuneration. Educational supervision is ensured by one or more elementary and intermediate education inspectors.

The intermediate education colleges, although financially independent, are often attached for convenience to a larger establishment for financial-management purposes. Their administrative supervision is the responsibility of the *wilaya* educational directorate but the supervision of the teaching given in them is ensured by intermediate education inspectors with responsibility for varying geographical areas depending on the discipline involved.

The *lycées* and technicums are financially independent public establishments. Educational and administrative supervision is ensured by a body of general inspectors mainly centralized at the ministry itself.

The literacy centres and offshoots of the technical establishments providing back-up to educational activities (educational documentation, educational and vocational guidance, school canteens, etc.) are administered independently with the aid of the local communities and linked to the central services through the channel of the *wilaya* educational directorate.

Bouzid Hammiche

Educational planning and reform

Since 1962 Algeria has been on the path of economic and social development, having opted to build a socialist society and to organize its efforts in a planned framework. Following the revolutionary reforms of 1965, the confirmation of the fundamental political choices and the regaining of control of the country's natural resources and major sectors of activity, a three-year pre-plan (1967–1969) was drawn up to promote economic recovery. Its main concern was to set up the planning machinery. Educational planning, initiated immediately after the gaining of independence in the Ministry of National Education in order to bring growth in a particularly sensitive sector under control, was immediately fitted into the overall development planning process. A number of special features were retained both in terms of structures and support services and of methods and procedures for data acquisition and processing.

In the field of education and training, it is usual to distinguish between quantitative information of a statistical and numerical nature and qualitative information, based on reports and assessments. A combination of the two types of information and their appropriate processing form an essential preliminary to the preparation of projects or the proposing of new measures by the departments responsible whose acceptance leads to decision-making.

Whilst the acquisition and processing of statistical data differ by sector and by the way each sector's services are organized, the general objectives are the same, namely to describe the situation at a particular date according to its various aspects or main parameters and to analyse that situation by appropriate statistical methods in order to establish probable trends.

School statistics concerning primary and secondary education, and those on extramural education, are for the most part based on an exhaustive survey held on 15 November each year. The questionnaires, accompanied by instructions and explanatory notes, are drawn up each year by the central administration and issued to the various establishments through administrative channels. Replies are collected along the reverse path and checked at the level immediately above that at which the data are produced. The survey is analysed, in the main, at *wilaya* and central levels. The elementary school inspectors have one questionnaire for each school in their area and, where necessary, can go ahead with a preliminary processing of the data or consult the various tables with a view to organizing their activities. The questionnaires are designed so as to allow manual analysis (using small calculators) by *wilaya* staff and automatic data processing by computer at the central level.

The descriptive stage of the data processing gives rise to the publication of a statistical yearbook giving the following figures by *wilaya*, for the whole of the national territory and by educational level: enrolment figures, broken down by sex, nationality, school origin (repeaters and non-repeaters), speciality where applicable, age and type of education; the number of teachers, broken down by sex, nationality, level of qualification, speciality and teaching language; the condition of premises and facilities according to their nature and conditions of use; the financial situation of the establishments and the breakdown of operational appropriations by item of expenditure.

Other data are collected by sample surveys at the establishments, using appropriate sampling methods.

Statistical analysis is used for reports and the calculation of various indicators such as: enrolment rates per year or per age-group, broken down by sex and geographical area (the overall enrolment rate, in particular, is worked out systematically each year by relating the total number of pupils attending elementary schools to the number of children of 6–13 years of age); repeat and drop-out rates by course year and rates of admission; female and male enrolment rates and the boy/girl ratio (number of boys divided by number of girls); relationships such as pupil/teacher, pupil/course or educational division and pupil/classroom ratios; unit operating and investment costs (cost per place, average cost of school year per pupil); success ratios at examinations and competitions.

The application of simple mathematical models to cohort analysis and data processing by computer enables short- and medium-term forecasts to be produced according to various assumed trends in the calculated indicators. The output tables are designed to suit requirements; they may relate to the whole of the system at the national level or to a particular sector in a given area.

Projections to 1985 have been produced on this basis for all the components of the educational system.

In the higher education sector, because of the relatively small number of students and the location of university units in only a few large towns, the quantitative data on both students and the teaching staff are collected on individual sheets at the beginning of each university year. Details of premises and scientific and educational facilities are kept on a register which is updated as and when new additions or changes occur. The operating budget is similarly processed by university unit or establishment.

This use of data processing, after centralizing all the individual data sheets and the most varied additional data, gives a set of files which are both processed individually and then cross-checked for the most significant correlations.

A statistical bulletin is brought out each year giving: (a) for students, their breakdown by sex and nationality in each stream and each university establishment and (b) for the teaching staff, their number by speciality and grade, by sex and nationality, and by speciality, for each university establishment.

The indicators and teaching staff ratios are not worked out systematically, in view of the complexity of the modular educational system, but the rates of occupation of educational premises and social facilities (accommodation and catering) enable future prospects to be forecast and requirements to be evaluated.

Qualitative data: the periodical reports drawn up by the heads of the different establishments, by inspectors or by commissions or local committees, are used to ascertain many different facts about the state of evolution of the educational system. Evaluation studies are made as time goes by, using objective studies at the key levels of educational activity in order to take the assessments in the administrative reports to greater detail and depth. These evaluations generally relate to the aptness of educational programmes, the comparative effects of the methods being used, etc. They are supplemented by sociological and psycho-pedagogical surveys the results of which are not always published.

Correlations are thus established between phenomena such as scholastic success and the socio-economic origin of pupils, correct restitution of the ideas that are taught and the qualifications of the teacher or class size, the use of certain educational media and the acquisition of specific abilities.

The studies carried out under this heading are rarely the work of a single specialist. To be valid, they require multidisciplinary teams and the continuous comparison of different standpoints. And even when standardization or mathematical analysis procedures are used to apply a common yardstick to subjective judgements, the results arrived at are exposed to the critical consideration of various standpoints for explanatory comment that is as realistic as possible.

On the basis of data acquired and suitably processed, the design of projects and the preparation of proposed measures are the responsibility of technicians working in specialized institutes or administrative teams in specific structures.

In most cases, the exploitation of information collected from various sources is regarded as the first phase of a process of study. It is followed, as the case may be, by consideration and analysis by a technical team or directly by discussion in a committee which may be a standing body or a working party made up in such a way as to bring together the most varied interests and levels concerned in the question.

As a general rule, work in committee is preceded by the drafting of a summary preliminary project whose object is more to stimulate discussion and induce critical analysis than to outline solutions or possible decisions.

Decision-making is the third phase of the process and takes the material form of the preparation of administrative or legal texts which become rules or directives for the services concerned.

In primary and secondary education, where the main task up to recent years has been to run a complex educational system and at the same time gradually introduce improvements in preparation for reform, decisions have taken the form of drafting circulars and new instructions modifying certain operational rules and introducing changes in specific fields of activity.

For this reason, the catalogue of periodical activities—once it has been set down in the administrative timetable—is supplemented by the publication, as and when necessary, of circulars and instructions sent by the central administration to the external services and establishments. These texts are grouped and published periodically in the *National Education Official Bulletin*, which is widely issued to all services and staff concerned in educational activities.

For higher education, which has been launched 'feet-first' into reform, the new measures are in the form of more general and fundamental provisions and often require the issue of legislation or regulations which may be ordinances, decrees or orders. These texts are published in the *Official Journal of the Republic* and are accompanied, when they appear, by circulars and implementation instructions setting out the conditions for putting the measures into effect or explaining the precise arrangements.

With the university reform in effect for seven years, the results are now being assessed so as to have a critical evaluation of achievements and gaps and so that the necessary corrective measures may be taken with regard to the administrative organization of university institutions and the definition of higher education streams, the development and application of modular educational programmes and finding and mobilizing resources so that needs may be better met.

A concrete example of the role of information in making an educational decision—the decision to set up the technicums

A technicum is an establishment designed for the training of engineers in various fields to meet the requirements of economic activity (agriculture, industry, commerce and services). The administrative and educational organization of these establishments is laid down by a decree on technological and vocational training made under the Ordinance of 16 April 1976 regarding the organization of education and training.

In 1968, the Algerian educational system, in spite of the changes that had been made, was organized largely in the same way as it was prior to independence.

Downrated because the cast-offs of general education gravitated to it, technical and agricultural education was doubly handicapped because, first, nationa education had neither the technical installations and facilities nor the professional teaching staff necessary to carry out training programmes and, secondl because the few candidates, trained by their three years at technical college and four years at agricultural college and awarded the Certificate of Professional Aptitude (CAP), were considered to be ill-suited to the requirements of economic activity. The latter was entering a period of vigorous recovery because of the technological decisions taken by those responsible for industrial development and had greater need for senior engineers and management grades than for low-grade manpower and labourers. A survey on the future of pupils from the technical and agricultural colleges showed that the vast majority of young people with the CAP were in jobs that had no connection with the speciality they had trained for.

Whereas the main concern between 1962 and 1966 had been to bring the machinery of national activity under control, the 1967–1969 preliminary plan brought about a major economic recovery because of the priority given to the type of industry that generated other industry (primarily heavy industry). The lack of integration in investment projects and the lack of knowledge about growth prospects made it impossible to form any picture of qualified manpower requirements at the national level. Only the recruitment departments in business firms were in a position to estimate employment possibilities in the immediate future and to forecast very short-term trends in staff at each workplace. The surveys carried out by the educational and vocational guidance centres and the regional manpower offices came up against communication difficulties and lack of co-operation on the part of the employers.

Already regarded as the deprived sector of secondary education in the original system, technical and agricultural education suffered considerably from the fact that the equipment appropriations available to the minister were not sufficient for renewing its technical installations (machinery, tools, work stations) to keep the training in step with technological development. In addition, whereas Algerian industry was only just coming to life, the requirements laid down by the rules of the teaching profession in terms of diplomas and seniority in active life for the recruitment of teachers in technical education reduced the teaching staff for the technical and agricultural colleges to nothing.

All the above facts were brought out and discussed in a number of seminars held by local educational officials and heads of the central education department in an attempt to find a different system. After several tentative suggestions and unsuccessful attempts mainly consisting of an extension to the time spent in the technical and agricultural colleges, the plan to set up technicums was worked out.

In the first phase, the technicum took the form of a two-tier establishment grafted onto general, first-cycle education after the first two years of observation (classes 6 and 5). The first tier, lasting two years, was to lead to a CAP in the speciality chosen. The second tier, for the most successful pupils, was also to last two years and successful candidates would be awarded an engineer's diploma.

This first scheme was given up when its implementation was at the half-way point in favour of the present technicum system in which candidates are recruited from the intermediate level and trained for the engineer's diploma in a three-year course. The decision taken in 1970 to set up five experimental technicums was based on earlier experience and available information. It was influenced by the movement to set up new-type training establishments—technology institutes—and by reference to foreign experience. It was preceded by a brief round of consultations with potential employers in an interministerial commission on vocational training and by groups, under the aegis of the central administration, of certain heads of establishment and specialists in in-firm vocational training. International experts engaged via the International Labour Organisation (ILO) and Unesco took part in formulating strategies for the installation of technicums and in evaluating approximate long-term engineer requirements.

Data collection. Apart from the educational statistics collected and processed each year, of which the series from 1962 to 1970 made it possible to establish valid projections, the only consistent data available were general population statistics. The problem of young people between 14 and 17, and particularly those in the urban environment, was so acute that all attention was focused on the educational solution in terms of gradually introducing basic education lasting nine or ten years for all.

Out of this arose the decision to unify intermediate education and to defer concerns about vocational training to a later stage, after the fourth intermediate year.

Visits by Algerian officials to various countries of Eastern Europe and visits to Algeria by a number of consultants from these same countries were the occasion for detailed scrutiny of systems of technical and vocational training. The name 'technicum' illustrates this influence in spite of the differences in form, level and organization that establishments with this name may exhibit from country to country.

Set up in 1969 as exceptional vocational training establishments intended to meet needs which were themselves exceptional, the technology institutes, rather similar in form to the French Institut Universitaire de Technologie (IUT), helped the search for engineer training schemes that would be more flexible and faster and better tailored to employment requirements, for grades immediately below the technical management level.

Whilst the other ministries set up technology institutes at B and C level to train their intermediate and even junior manpower, the Minister of Education felt that the technicum principle was a more general and more suitable answer because, with certain pre-defined streams, it covered the occupational requirements of several sectors at once.

Although difficult, for various reasons, to establish, communication with employers of management grades showed (in cases where communication was possible) that job profiles in various branches had a large number of similar features. The need for a common core of vocational training and for operations organized in two phases was recognized: an initial and fairly general stage to cover the acquisition of knowledge and know-how in a given speciality (electrical engineering, for example) and the other, more specific, following, the first and aimed at practical adaptation to the job (maintenance engineer, for instance).

The Ministry of Education seemed best suited to conduct operations of the former type whereas the second stage would be left to the production firms themselves.

The implementation of this organization has not yet gone beyond the stage of good intentions; acquired habit continues to dominate activity in this sector.

EXPERIMENTATION

Trials with the vocational training system for engineers were carried out in the five experimental establishments on a pragmatic basis, no formal decisions being taken to retain the performance of certain operations.

Choice of experimental establishments

Five establishments were selected from the sixty or so existing technical training colleges on the basis of geographical distribution (two in the West, two in the Centre and one in the East), mainly for reasons of size, relatively new equipment and capability of the director in charge of the experiment.

Definition of training streams

This depended on the prior existence of the necessary facilities for practical training and instruction and was decided after consultation with industries employing engineers and their assessment of the most extensive and regular requirements.

Since the cycle of training in technicums is relatively long and their operation has to be continuous, the disciplines covered have to correspond to a relatively stable demand for graduates.

Drawing up of programmes

Joint, pluridisciplinary commissions made up of Algerian teachers and foreign specialists are responsible for developing education contents (lessons, practical work and training courses) on the basis of education objectives worked out from job profiles.

An appropriate educational methodology by functional modules—and not by discipline—in six-monthly periods has been explored and applied with all its implications as regards the preparation of activity sequences, the way instructors' working hours are employed and the pattern of relations with local employers.

Certificates and examinations

After three years in a technicum, students take a series of examinations and tests for their engineer's diploma. Though regarded as equivalent to the *baccalauréat* as regards access to higher education, this diploma has not yet, in fact, been accepted as such by those responsible for university policy. The employers of senior staff, for their part, have not yet recognized the quality of this training or made proper arrangements for evaluating the new engineers since no contractual procedure has yet been introduced binding firm, technicum and trainee to reciprocal commitments.

Training media

As regards the commitments on the part of business firms, it was intended that, in addition to training courses in firms' workshops and under the joint responsibility of their own skilled staff and the teaching staff, they would be involved in the technological adaptation (replacement and modernization) of the establishment's technical installations and appoint certain types of specialist for part-time teaching. These latter, who are intended subsequently to form the majority of the teaching body in technicums, will be responsible for ensuring that the training is continuously adapted to the requirements of industrial activity, developments in processes and techniques and the modernization of industrial plant.

Generalizations

The reform implies that this new engineer-training institution is to be brought swiftly into general use and this will require the prior provision of a first phase of thirty new-type establishments with the relevant equipment and the training of the relevant teaching staff and, therefore, the creation of one or more training centres for them.

For so promising and serious a decision as the setting up of technicums in the perspective of an overall remodelling of the educational system, not everyone was convinced about the rightness of the experimental approach. The information on which the initial decision was based may have been regarded as fragmentary and provosional both as regards the unsuitability of the technical training colleges and the nature and scale of the requirement for senior personnel in the various economic sectors. The absence, throughout this period, of responsible bodies for applying overall policy lines, the lack of information on projects being put into effect or planned, and the weakness of the research and design structures made difficult dialogue between the participants and scientific study of all the data; this made it hard to prepare several practical solutions from which to make a reasoned choice of the most convenient, most effective and best adapted to not only the realities of the moment but to longer-term objectives as well.

Final comments

Whilst the acquisition and processing of data vary with the nature of the data itself, with the level of education concerned and with the condition of the structures responsible for it, the major concern is to supply the most relevant information on the present situation, the way it is changing and future prospects, at the time required and in the form desired, in order to enable policy-makers to take their decisions in full knowledge of the facts.

The decision in favour of planning, combined with the decentralization of initiative to the local and regional level, made it necessary, in addition to increasingly frequent recourse to data processing, to set up machinery for co-ordination and harmonization among the various structures responsible for collecting and analysing quantitative and qualitative data. This made it desirable, so as to simplify the work of the popular assemblies at communal, *wilaya* and national levels, to determine a common methodology for the preparatory work on the plan.

Over ten years ago, a committee for the co-ordination of statistical studies (COCOES) was set up under the aegis of the central planning body with the objectives of: (a) making economic actors and administrations aware of the problem of statistics (collection, analysis and checking), periodical synthesis and, more generally, questionnaire surveys with the object of determining the state of the country's economic, social and cultural development in both overall and partial terms; (b) unifying and standardizing survey instruments, files and documents produced by analysing numerical data for purposes of comparability and useful regrouping; (c) economizing—by discipline and cohesion—the resources committed in the conduct of statistical surveys by setting up a full timetable of such surveys and by requiring prior approval of the responsible body in order to prevent overlapping and problems arising out of isolated initiatives or over-frequent surveys involving the same base cells; and (d) facilitating data centralization and storage whilst maintaining the confidential nature of statistical data.

This institution, though its value is unquestionable, has unfortunately had a great deal of difficulty in operating and almost came to nought after a certain time. The only responsibility it retains is the formal approval of questionnaires for statistical surveys.

The comparative studies produced by the responsible departments, and particularly those of the Central Planning Agency, enable lessons to be learned from international experience both as regards data acquisition and processing methods as well as procedures and problems of organizing structures and preparing and presenting projects. Design and consultancy offices, set up in the form of mixed-economy companies with the participation of various partners, combine the bilateral technical assistance of a government nature with the work of international experts and high-level consultants recruited via the United Nations Specialized Agencies.

6 Brazil[1]

Jacques R. Velloso

Educational planning in Brazil at the national level gained momentum in the late 1960s. A decennial plan was drafted by the Secretariat of Planning,[2] with the participation of the Ministry of Education and ministries in related areas.[3] This ten-year plan was preceded by a diagnosis of the educational sector, involving a description and a preliminary analysis of the three educational levels and their relationships within the sector and with the labour market. Both the diagnosis and the ten-year plan were a part of a larger planning effort, involving virtually all sectors of economic and social life.[4] The diagnosis intended to analyse, from a quantitative and qualitative perspective, the evolution of the educational sector in Brazil after the Second World War and thus provide the basic information required to prepare the plan for the sector. The plan aimed at setting the basic targets and guidelines for action in the educational sector, from a quantitative as well as from a qualitative standpoint.

In point of fact, Brazil had witnessed the drafting of other so-called educational plans in the early 1960s and before. But these plans were rather general in the sense that targets were very broad, qualitative goals were even less explicit than in the ten-year plan, and guidelines for action were almost non-existent.

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[1] This chapter was prepared for Unesco's Division of Educational Policy and Planning, and based in part on talks with experts and government officials involved in the educational planning processes in Brazil. Their contribution is greatly appreciated, although they may not share some of the views expressed here. Discussions with Divonzir Gusso were particularly helpful in the preparation of the manuscript. We are also grateful for the comments of Isaura Belloni Schmidt on an earlier version of the study.

[2] Then Ministry of Planning and Economic Co-ordination.

[3] Ministério do Planejamento e Coordenação Econômica, *Plano Decenal de Desenvolvimento Econômico e Social—Desenvolvimento Social (I): Educação e Mão-de-obra* [Ten-Year Plan of Economic and Social Development—Social Development (I): Education and Manpower], Rio de Janeiro, 1967, 2 vols.

[4] The diagnosis and the plan comprised macro-economic aspects, energy, agriculture, mining, industry, social development (where education was included) and urban and regional development.

The trend that began in the mid-1960s apparently levelled off by the mid-1970s. It followed the take-over of the government by the military, who held, in addition ot the Presidency of the Republic, several cabinet posts and a number of top and intermediate-level decision-making positions. Both the professionals and the military often shared a common concern with the internal efficiency of the governmental system, although they did not always agree on the goals to be pursued and/or on the relative priorities to be given to these goals. The trend was not reversed in the 1970s, and one of its net results was the prominence of the professional adviser or intermediate decision-maker *vis-à-vis* the role performed by the politician in the previous decade.

The apparently prominent role of professionals in governmental decision-making naturally leads us to inquire about the role they actually play in final decision-making processes. This chapter addresses itself to a particular aspect of this broader question as it relates to educational planning in Brazil. Here, we attempt to analyse the nature of the planning models as well as the basic structures and processes used in decision-making for educational planning in the country and to make a tentative analysis of the role played by the expert and by the politician in these processes. Educational planning in Brazil is carried out at different levels of government, and an attempt to deal with all these levels would require a rather large research effort. We concentrate on the federal level, given the impact this planning activity has for the country as a whole, particularly as it relates to resource allocation for the units of the federation.

Planning models

For our purposes, it is useful to look at educational planning activity within the framework described by Hallak,[1] where the roles of the expert and the politician are contrasted. In the *a-rational model*, the expert provides advice, but the politician makes the final decision in the process. The choice of social values and objectives is not made by means of rational criteria, but rationality does predominate in the choice of means to attain the goals of a plan. These goals, in turn, are a function of assessed needs and of the social values chosen. In the *techno-rational model* (also called the *rational model*), the expert takes precedence over the politician. Decision-making is based essentially on scientific and technical criteria. The politician simply carries out decisions made by experts.

Both models simplify reality in the sense that a decision-making structure or process may not follow the description of a paradigm. If we see these two models as opposite extremes on a continuum, an actual planning model may fit one of the extremes more closely, but will not necessarily coincide with either. Thus, we may speak of a planning system as one which uses an a-rational model, where the politician always takes precedence over the expert, while in reality the politician often takes precedence, but not always. *Mutatis mutandis*, the same applies to the techno-rational model. Furthermore, social reality is dynamic, and while the planning system of a country might be closer to one of the models in a given period of time, it could approach another model in a subsequent period. Finally, in our view, one type of decision is not necessarily superior to the other. The superiority of a scientific criterion over a political criterion depends on the nature of the problem being considered and/or upon the goals to be achieved with the planning activity.

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[1] Jacques Hallak, 'Employment, the World of Work and the New Perspectives for Educational Planning', in Hans Weiler (ed.), *Educational Planning and Social Change*, Paris, International Institute for Educational Planning, 1980. 212 p.

Educational planning models in Brazil

Current educational planning models used in Brazil have their origins in government efforts to provide the country with medium- to long-range forecasts for the economy, which were developed in the mid-1960s. Current plans typically draw heavily on earlier plans, except when they contain different goals and/or strategies to be pursued. The case of Brazil is one in which the ten-year plan of economic and social development, referred to earlier, went through several marginal adjustments, as revealed by the documents drafted in subsequent years. The ten-year plan was short-lived as far as the original document and its implementation were concerned. As a new administration was inaugurated shortly after its publication, a new plan was drafted. However, it is instructive to look at the planning models used since they did not undergo substantial changes in the following plans.

THE TEN-YEAR PLAN

In the ten-year plan, overall goals were set by the government for all economic and social sectors. Actually, the macro-decisions consisted essentially of economic targets to be achieved. From these, social targets were derived or added. The educational planning model was then developed within this framework of constraints defined by the overall goals to be pursued.

The plan was drafted in the wake of enthusiasm among planners regarding the role of education in economic growth, spurred by studies carried out in the early 1960s[1] and by proposals which suggested an apparent ability of science and technology to predict manpower requirements for economic and social development.[1] Some of the assumptions underlying both the approach used in studies to measure the contribution of education—usually defined as formal schooling—to economic growth and the techniques used in manpower forecasts were consistent with the general orientation followed by the military governments in the 1960s. This orientation included a deep concern with efficiency in the production and distribution of goods and services, but little—if any—attention to equity in that distribution. It also involved an emphasis on the role of schooling as the producer of skills that would allow the country to overcome shortages of qualified workers and professionals.

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[1] Particularly by the work of Theodore Schultz (*The Economic Value of Education*, New York, Columbia University Press, 1963), stressing the economic value of education, and by the work of Edward Denison ('Why Growth Rates Differ', *Postwar Experience in Nine Western Countries*, Washington, D. C., The Brookings Institution, 1967; *The Sources of Economic Growth in the United States and the Alternatives Before Us*, New York, Committee for Economic Development, 1962), attempting to measure the contribution of education to economic growth.

Two approaches were used in the model adopted in the ten-year plan for the education and employment sectors. The *manpower forecasting approach* followed the procedures that relate economic growth to changes in employment in different sectors of the economy and, within these sectors, to changes in the occupational composition of the labour force which are then translated into skill 'requirements' to be produced by the educational system. While little theory underlies such an approach, it does comprise a tool which is derived from a conceptual framework in which schooling is related to worker productivity. Different amounts and types of schooling find correspondence in different occupations. Employers demand productive capacities for different occupations and these are provided by schooling. The approach in itself is an attempt to predict the amount and types of schooling that will be required in the future, as the economy grows. Such an approach fits into the techno-rational planning model, as described briefly above. It was applied to forecast enrolments at the college level and for upper secondary schooling, particularly for the vocational track of the system in force at that time.

The other component of the planning model adopted was the so-called *cultural approach* (or *social demand approach*), which was used to predict enrolments at the elementary and lower secondary schooling levels. In this approach, a variety of options is available for estimating enrolment targets. The ingredients for these estimates involve current enrolment and enrolment ratios in the relevant age-groups, current and projected productivity trends of the school system and relevant population growth rates. This approach simply forecasts enrolment growth on the basis of relevant population growth rates and on the basis of some exogenously determined criteria (enrolment ratios in age-groups). Endogenous variables (drop-out rates, promotion rates) also have their values defined by exogenous criteria—some assumptions regarding the decrease in drop-out rates, for instance—or by a mechanical projection of the behaviour of these variables in the past. The cultural approach employs technical tools borrowed from demography and occasionally from statistics, but without a solid conceptual or theoretical foundation.

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[1] The work of Frederick Harbison and Charles A. Myers (*Education, Manpower and Economic Growth*, New York, McGraw-Hill, 1964) was instrumental in generating such enthusiasm, in spite of a lack of scientific concepts and rationale in their writings (see Mary J. Bowman, 'Review of F. Harbison and C. A. Myers, *Education, Manpower and Economic Growth*', *Journal of Political Economy* (Chicago), October 1966). The Organization for Economic Co-operation and Development (OECD), particularly through the work of Herbert Parnes (*Forecasting Educational Needs for Economic and Social Development*, Paris, Organization for Economic Co-operation and Development, 1962), played an important role in producing positive expectations regarding the success of manpower forecasts.

The information used in the drafting of the ten-year plan was obtained from a preliminary diagnosis of the educational sector[1] which was a part of a set of background and descriptive studies. These were prepared specifically for planning purposes by the various departments of the Secretariat of Planning, with the co-operation of the ministries in each of the relevant areas.

The study for the educational sector intended to provide quantitative as well as qualitative information. The latter, as is well known, is usually difficult to obtain. This is due to ambiguities in the concepts of 'quality' in education as well as to the fact that data collection for variables which attempt to measure qualitative aspects of educational inputs or outcomes typically has relatively high costs. The studies did provide some data on qualitative aspects of the educational sector, such as the percentage of teachers with appropriate degrees and/or training, by level of schooling, but most of the information provided by the diagnosis could be termed of a quantitative nature. Therefore, most of the targets set by the ten-year plan also were of a quantitative character and targets for the improvement of educational standards were often established without the required background information.

It is relevant to describe the basic sources for the background study and for the ten-year plan, as well as some of the procedures adopted in obtaining the data. Both the sources and the procedures have not undergone substantial changes over the years. Rather, a few additional sources of data were used to draft the current plan for the educational sector.[2]

Data for the background study were obtained from three basic sources: the Brazilian Census Bureau, the Ministry of Education, and scattered research and surveys conducted by researchers in the field. Most of the research reports util ized were based on research done at the then National Institute of Pedagogical Studies (INEP; today the National Institute for Educational Research and Studies, an agency of the Ministry of Education). Another agency of this Ministry (Service of Educational and Cultural Statistics, SEEC), which is in charge of periodic data gathering on the educational sector,[3] provided the majority of the data on enrolment and teachers for the different levels of schooling, except for graduate education. The data for this level of schooling were provided by the Co-ordination for the Improvement of Higher Education Personnel (CAPES, at that time the Campaign for the Improvement of Higher Education Personnel) also an agency of the Ministry of Education. This agency obtains the relevant data directly from the graduate programmes in research institutes, colleges and universities. Data on non-formal education programmes were also supplied by the Ministry of Education, which obtained basic data directly from the programmes funded by the ministry.

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[1] Ministério do Planejamento e Coordenação Econômica, Escritório de Pesquisa Econômica Aplicada, *Educação: Diagnóstico Preliminar* [Education: Preliminary Diagnosis], Rio de Janeiro, 1966, 2 vols.

[2] A substantial change, however, occurred in the process of decision-making, where the Ministry of Education played a more important role in the preparation of later plans.

[3] The network of data gathering is connected with state and local units of the Brazilian Census Bureau. Most of the basic data at the local level are collected by Census Bureau personnel.

The Institute of Geography and Statistics of the Brazilian Census Bureau (today the Foundation Institute of Geography and Statistics, FIBGE) supplied general data on population, and a number of the demographic studies conducted by this agency were used in the educational plan. At the Secretariat of Planning, the then Sector of Education and Manpower (today the National Centre for Human Resources—CNRH) assembled and tabulated the data obtained from this agency, from the Ministry of Education, from other ministries (e.g. Ministry of Labour, Ministry of Health) as well as from a few independent or university-based research reports. In some instances, experts from the CNRH also conducted additional studies and/or adjusted the data gathered.

MEDIUM-RANGE PLANS

Following the ten-year plan, three educational plans were drafted within the basic models described, with occasional shifts in emphasis. The Strategic Programme for Development[1] comprised a period of three years, and its education and manpower section incorporated a few adjustments in the previous targets. Other than that, however, the targets remained essentially the same for the year 1970. These adjustments were made in the light of new data collected and of corrections made in the previous educational statistics, corrections which became available as the existing information-gathering systems of the government were consolidated. The programme for the educational section was not preceded by a new background study. The inputs used consisted of updated information obtained within the framework of the background studies conducted in 1966.

This programme was followed by the First National Plan for Development, which included a Sectorial Plan for Education and Culture.[2] (The document containing the plan was published a few years after the beginning of its implementation.) Physical targets were again obtained through the manpower forecasting and cultural approaches. This similarity, however, is mainly formal. In spite of the fact that both approaches were used, it has been pointed out[3] that

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1. Ministério do Planejamento e Coordenação Geral, *Programa Estratégico de Desenvolvimento 1968–1970—Infraestrutura Social (I, II): Educação e Recursos Humanos* [Strategic Programme for Development 1968–1970—Social Infrastructure (I, II): Education and Human Resources], Brasilia, 1969, 2 Vols.
2. Ministério da Educação e Cultura, Secretaria Geral, *I Plano Setorial de Educação e Cultura 1972–1974* [First Sectorial Plan for Education and Culture 1972–74)].Brasilia, 1972.
3. See Divonzir Gusso, 'Teoria Econômica, Economia da Educação e Administração Educacional [Economic Theory, Economics of Education and Educational Administration]', paper presented at the ninth Symposium on Educational Administration, National Association of Educational Administration Professionals (ANPAE), Federal University of Parana, Curitiba, July 1978 (mimeo.).

the overall rationale underlying the plan was heavily influenced by the principles of the educational reform enacted in 1971 (Law 5,692). Special attention was given to the so-called professionalizing goal of the new educational system and to the rate of growth of higher education enrolments.

Studies for the educational reform were initiated at the Federal Council for Education. The council is an agency of the Ministry of Education and has advisory status to the minister. From a hierarchical standpoint, it is above the heads of departments, who are members of the council, along with other educators. Among its functions, the definition of educational policy in the country is the one most germane to our purposes here. As with the higher education reform enacted in the late 1960s, the primary and secondary evaluation reform was sent from the council to the minister and then to the President, who officially submitted it for Congressional approval.

Under the reform, elementary education, now called basic education or first-degree education, comprised eight years of schooling, including the previous elementary and secondary school periods. Senior secondary schooling, now called 'education of the second degree', had its objectives changed by the law in the direction of comprehensive secondary schooling. The academic (or general schooling) track was defined in the law as having a 'terminal' character. The student would experience different sorts of quasi-vocational courses and would thus be exposed to a variety of practical skills required in different jobs and to equally varied types of work-place environments. Students graduating from this new system presumably would be better able to find a job in the labour market than their counterparts graduating from the original secondary school system.

EDUCATIONAL REFORM AND PLANNING MODELS

Since the objectives of the educational reform were naturally made an integral part of the educational plans, it is relevant to take a brief look at the nature of the basic changes defined by the reform.[1] These changes were both quantitative and qualitative. The quantitative change consists of an extension of the compulsory schooling years, following the recommendations of Unesco conferences and the government's social objective of supplying basic schooling to larger segments of the population. The main qualitative change is the setting of new goals for upper secondary schooling, although regulations of the reform law issued in subsequent years modified the intended character of the new system, allowing smaller changes in goals than had originally been proposed.

The goals defined by the reform meant that students would graduate from upper secondary education better prepared to enter the labour market. This objective may be viewed as an outgrowth of Dewey's philosophy to the effect that the school should be a microcosm of life itself. Therefore, school experience at the upper secondary level should encompass work experiences similar to those that will be faced in the work place. In addition to this socializing role of the new upper secondary education, two other goals were envisaged by the reform. First, graduating students would be better prepared to take a job in the labour market, given the exposure in school to a variety of skills typical of both white-collar and blue-collar jobs; this is the 'terminal' character of second-degree education. Second, the new organization of second-degree education would contribute to reducing the socio-economic differences typically observed between students in the academic and in the vocational stream.

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[1] For an extensive discussion of the origins, present operation and perspectives for first- and second-degree education in Brazil, see Valnir Chagas, *Educação Brasileira: O Ensino de 1o. e 2o. Graus* [Brazilian Education: 1st and 2nd Degree Schooling], Sao Paulo, Saraiva, 1978.

The educational reform is directly related to the educational planning model used, since it defines boundaries within which this planning is to be done. Thus, the lengthening of compulsory education to eight years implies a change in the criteria adopted in the cultural approach and in the targets that resulted from projections made. Similarly, the terminal character of second-degree education presumably affects manpower projections, since it is expected that a large percentage of graduating students will enter the labour market. In addition, the new teachers required for the new curricula in second-degree education imply a change in the planning of teacher training. In addition, equipment and space for this level of schooling imply changes in resources and criteria in planning the expansion of the educational system.

CURRENT PLANNING MODELS

The current plan for education (Second Sectorial Plan for Education and Culture (1976)) is also a part of a larger plan (Second National Plan for Development) and adopts the manpower and cultural approaches used previously. From a formal standpoint, both techno-rational and a-rational models are used, and quantitative as well as qualitative aspects of education are taken into account. The previous plan was heavily influenced by the principles of the educational reform, thus paying relatively more attention to qualitative aspects of education. In the current plan the shift in emphasis takes a second step from a human resources approach to wider qualitative concerns.

Qualitative aspects of education[1] are defined rather broadly in the plan, and indeed this is a field in which typically it is difficult to obtain a consensus regarding standards of quality. Among the qualitative aspects of education included in the plan, improving the quality of teaching is a major concern. This is to be achieved by (a) experimentation with new teaching methods matched to the characteristics of specific groups of students in formal and non-formal educational processes and (b) expanding graduate education and improving academic standards in graduate programmes, which would have an impact on the training of teachers and administrators at lower levels of schooling.

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[1] The definition of what is a qualitative aspect of education is not an easy matter. For our purposes, a very simple criterion will be used. First, we will take as qualitative aspects those features that the plans consider to be such. Second, if there is ambiguity in the plan in this regard, qualitative aspects will be those that deal with changes in the nature of a certain variable rather than with changes in the quantities measured. There is still some ambiguity in this distinction, since changes in the nature of a certain variable could be translated into a quantitative measure, but this seems to be unavoidable if a distinction is to be made between quantitative and qualitative aspects of educational phenomena. Actually, Fred Kerlinger (*Foundations of Behavioral Research*, 2nd ed., New York, Wiley, 1973) argues that the distinction between qualitative and quantitative educational phenomena is incorrect, and that for research purposes, all 'qualitative' variables should be converted into measurable quantities. Others have

The improvement of academic standards is seen in the plan as heavily dependent on the relative increase of full-time faculty members in higher educational institutions. The majority of college professors in Brazil hold more than one job, teaching at two (sometimes three or four) or more higher education institutions. This presumably results in relatively low academic standards, since little time is left for research or for study to keep abreast of current developments in the field. The current plan, continuing the policy of the previous plan, intends to increase full-time faculty in public education by 89 per cent and to increase part-time faculty (weekly workload of twenty-four hours) by only 32 per cent.

A specific background study was not prepared for the purpose of generating the information required for the current plan. The process of updating information within the framework of the diagnosis made in 1966 was continued, using previous sources of data as well as some new sources.

One explanation for the absence of background studies may lie in the behaviour of higher education during the previous years. Since the end of the period covered by the Strategic Development Plan, available data showed that the growth of higher education enrolments and graduations was much beyond the levels required by manpower forecasts. On the other hand, by the end of the decade the manpower approach had suffered severe criticisms from experts in the field, particularly from economists and from education economists. Evaluations of the manpower planning outcomes, including those of a major international project, showed a dismal picture in terms of accuracy of predictions.[1] An important criticism centred around the use of fixed input–output coefficients. This method did not allow for substitutability among different kinds of labour or between labour and capital. Furthermore, the use of fixed coefficients was not sensitive to the interplay of supply and demand for schooling or to the interaction of supply and demand for skills in the labour market; the method was, therefore doomed to failure.

Given the uncertainties of the results yielded by the approach, as well as

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argued that qualitative methods of inquiry in education are relevant: '. . . they tend to emphasize the importance of content in understanding; they tend to place great emphasis on the historical conditions . . . and they tend to argue that pieces cannot be understood aside from their relationship to the whole' (Elliot Eisner, 'Humanistic Trends in the Curriculum Fields', *Journal of Curriculum Studies* (Glasgow), Vol. 10, No. 3. 1978, p. 198).

[1] For an evaluation of the Mediterranean Regional Project, see Robison Hollister, *A Technical Evaluation of the First Stage of the Mediterranean Regional Project*, Paris, Organisation for Economic Co-operation and Development, 1966.

the evidence that enrolments and graduations had exceeded the forecasts for higher education, it is only natural that no background studies in this area were conducted.[1] This explanation, however, does not tell us why background studies were not made for other sectors of the educational system. It is possible that updated information was sufficient for planning purposes and therefore the benefit of additional studies would not offset the costs involved. Alternatively, this may have been a political decision and therefore resources were not allocated for that purpose.

Structures and processes of decision-making

The previous sections described the models used in the educational plans in Brazil and discussed these models with reference to the techno-rational/a-rational framework, particularly from the standpoint of the criteria used in decision-making. This section is addressed to a description and analysis of the basic structures and processes of decision-making within the same framework, but from the perspective of the role played by different actors in the process. It also describes additional sources of information that have not been considered in the previous section and uses some examples to analyse the interaction between these sources and the decison-making processes.

THE DRAFTING OF OPERATIONAL PLANS

Up to now, we have been concerned with educational plans covering periods that varied from three to ten years. These we termed medium- and long-range plans. Each of these plans had its corresponding operational plans, covering a one-year period, drafted every year, incorporating adjustments into the multi-year plans and at the same time providing inputs to the drafting of new medium- or long-range plans. It is relevant to review the basic processes underlying the drafting of operational plans as they relate to medium- and long-range plans.

The government, at the political level, defined the major constraints for the Second National Development Plan and the Secretariat of Planning provided basic guidelines for the macro-economic model.[2] The Second Sectorial Plan for Education and Culture was then drafted in preliminary form at the ministry.

Let us take a look at the process of drafting this plan. At the Ministry of Education, the co-ordination of planning activities is done by the General

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[1] For a summary of general criticism, see Mark Blaug *An Introduction to the Economics of Education*, Middlesex, Allen Lane, The Penguin Press, 1970; for an exercise on planning manpower demand, taking into account variations in wages as a response to supply and demand conditions, see Hans Thias and Martin Carnoy, 'Educational Planning with Flexible Wages: the Case of Kenya', *Economic Development and Cultural Change* (Chicago), Vol. 20, No. 3, April 1972, p. 438-73.

[2] This is a simplified picture. The macro-economic model is defined through interaction with relevant ministries, but the final model and targets to be achieved are actually established by the Secretariat of Planning, drawing upon studies made by the Institute of Applied Economic and Social Research, an agency of this secretariat.

Secretariat. Within each department of the ministry, a team of advisers prepares a preliminary project for its area, and the head makes the final decision before submitting the project to the Secretary-General, who provides the guidelines for the project. This is not to say that the projects are unrelated among themselves, nor that no co-ordination activity exists in drafting them, as in the process described by Damiba.[1] It simply characterizes the plan for the educational sector as a set of projects. The degree of integration of these projects depends upon the nature of the guidelines defined by the General Secretariat and by the actual co-ordinating activity of this agency. Once the set of projects is approved, the sector plan is sent to the Secretariat of Planning as a part of the national plan.[2]

In the process described, the final decision-making at the department level and at the ministry level is done by officials appointed by the government and who remain in office as long as they retain the government's confidence. Thus, from the standpoint of the roles performed by the actors in the decision-making process, the plan is the result of a set of political decisions. Whether the criteria used in the decisions are predominantly technical or political is an empirical question which cannot be answered *a priori.*

At this point, it is useful to return briefly to the perspective of the criteria adopted in the decisions made. The previous analyses focused on methods used in defining the targets to be achieved but made no distinction between physical targets and resources available to meet these targets. Data on costs of inputs usually are not available at the level of disaggregation that is required for planning purpose. When physical targets are established, apparently there is no strict relationship between such targets and the resources available to meet them. Thus, it seems that the final definitions of physical targets are based on projections of past trends of expenditure growth and later adjusted according to the expenditure constraints established by the Secretariat of Planning.

If expenditure constraints were predominantly the result of economic projections, we might have a techno-rational model of decision-making. However, while the rate of economic growth forecast by the macro-economic model does give indications as to the size of the federal budget,[3] the allocation of this budget among different ministries has a major political component. At the margin, increases or decreases in a budget probably depend more on the social choices that define relative priorities than on economic or technical criteria. This means that whatever technical or scientific criteria are used in drafting an educational project or in preparing a sector plan, the final draft will be within the resource constraints which are defined, at the margin, according to an a-rational model.

Medium- and long-range national plans establish preliminary budgets for the periods covered and for each ministry. An annual operational plan is then

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1. Aimé Damiba, 'Theory and Reality in Educational Planning', in Hans Weiler (ed.), New Tasks in Educational Planning, Paris, International Institute For Educational Planning, 1978.
2. The integration of the plans for the various sectors depends on a co-ordinating activity which, at this level, is carried out by the Secretariat of Planning.
3. After some major choices have been made (e. g. a smaller or larger budget deficit versus a lower or higher inflation rate), both on political and on economic grounds.

prepared at the Ministry of Education in order to implement the multi-year plan. The operational plan typically undergoes a number of adjustments in the implementation process, especially regarding the targets to be achieved. Adjustments may increase or reduce the targets to be obtained in a given year and depend on a number of variables.

A key variable influencing targets is the pace at which financial resources are transferred from the Ministry of Finance and/or from the Secretariat of Planning to other ministries and agencies. Availability of resources at a given moment may require a temporarily modest target for a given project in order to maintain the target for another project. Decisions regarding this trade-off are presumably based on some technical criteria but political considerations probably play a major role in the process. These decisions are made at the department-head level or above and from the standpoint of the roles performed by the actors they also fit the a-rational model.

Another key variable influencing the targets to be achieved in the operational plan is the availability of supplements to the established budget. These resources originate from sources other than the national treasury and their availability may lead to adding targets or programmes to an existing project. The definition of new targets, the preparation of new programmes or the evaluation of proposals for new programmes is typically done by experts at the departmental level or at the General Secretariat, according to guidelines set by the heads of these agencies. Final decision-making follows closely the process just described, but while political matters play an important role, their importance is probably smaller than in the decisions that involve a trade-off between targets.

Past performance of projects and cost data are other variables influencing the adjustments to be made. Poor performance in the past may be due to unsatisfactory management of the project and/or to underestimation of the costs of inputs at the time when the project was prepared. Evaluation of performance and the nature of the final decision-making are very similar to the descriptions given in the preceding paragraph.

INFORMATION SOURCES

Some departmental projects are research-related or involve research and development efforts. Both are conducted by outside agencies, such as universities and research institutes, and are a source of important qualitative information for planning educational development. Resources allocated to research by the departments of the Ministry of Education and by the National Centre for Human Resources, Secretariat of Planning, are not very large when compared to the total volume of resources managed by these agencies, but they are large when compared to the budget of the ministry's research-funding agency, INEP. Information on research funding for selected topics is made available by the departments and/or INEP. Research proposals presented are then evaluated by experts at each department and a final decision is made by the head of the agency concerned. Here, as opposed to the decision-making processes just described, political considerations may be viewed as playing a minor role, if any.

Department heads typically accept the evaluation made by the experts. However, the final decision is made by the department head.

On the other hand, one may argue that political considerations were already in effect at the time that research priorities were determined. The evaluation of research proposals would then have a political character, in the sense that alternative research topics and/or alternative research approaches would be excluded by the definition of topics and approaches resulting from a decision with a political component.[1] At any rate, the findings of research projects funded by government agencies often comprise a relevant source of qualitative information for planning purposes.

Statistics on enrolments, on promotion and drop-out rates, as well as on resident population by age-groups, have been provided, respectively, by the National Service for Educational Statistics and by the Institute of Geography and Statistics, as described in a previous section. In addition to these statistics and to research funded by the government, another important source of information is the agencies in charge of carrying out the government's educational projects. This information is supplied for follow-up purposes to the operational plan. The follow-up is done by the General Secretariat at the Ministry of Education and by the National Centre for Human Resources at the Secretariat of Planning. The heads of agencies funded by the government or that carry out government-funded projects send rather detailed and periodic reports to the pertinent departments of the ministry, which later send them to the Co-ordination of Evaluation and Control at the General Secretariat. This information on the implementation of projects is, in turn, used in adjusting the current operational plan, as required, and in preparing the operational plan for the following year and the next medium-range plan.

Roughly two-thirds of the educational projects of the ministry are carried out by agencies outside the ministry: state secretariats of education, universities, colleges, federal technical secondary schools, the Brazilian movement for (adult) literacy, research institutes and others. The information supplied by these agencies is mostly of a quantitative nature. It includes data on physical inputs and on targets as well as data on expenditures, plus a rather sketchy evaluation of the project being implemented. While a part is relevant for planning purposes, the data provided are usually considered insufficient. A number of departments are concerned with data-gathering procedures and some are developing efforts to design information systems to provide them with the kind and amount of data required for routine decision-making and for planning educational development.[2] In recent years the Ministry of Education has created an information

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1. Cf. Luis A. Cunha, 'Os (Des)Caminhos da Pesquisa na Pos-Graduação em Educação no Brasil [(Wrong) Ways of Research in Graduate Programmes in Education in Brazil]', paper presented at the Seminar on Scientific Production of Graduate Programmes in Education, CAPES, Ministry of Education, Federal University of Paraná, Curitiba, May 1978 (mimeo.).
2. See, for instance, the project on an information system prepared for the Department of Supplementary Education, Ministry of Education, by Ediruald Mello, 'Sistema de Informações para o Ensino Supletivo [An Information System for Supplementary Education]', Brasilia, University of Brasilia, 1978 (mimeo.).

processing centre. It is being established gradually, absorbing the function of the National Service for Educational Statistics, and is expected to bring a considerable improvement in the efficiency of data gathering and information processing for educational planning.

There are a few other sources of information that might be called external sources or informal channels of information. There is no regularity in the provision of information by these sources, but they do represent important means of obtaining information, particularly on qualitative aspects of education. We have already alluded to research projects conducted by institutions funded by the government. Another source is dissertations in universities that have graduate programmes in education and related areas, as well as dissertations by Brazilian doctoral students abroad. Brazil is not a country with a large tradition of research in education, and some dissertations have proven to be comparable to other research of good quality that has been produced in the 1970s.

Both types of research efforts are particularly important as a source of information on non-formal education in Brazil. This is a sector in which, due to its very nature, it is relatively difficult to gather data; research efforts have traditionally concentrated on formal education. For these reasons, as well as because of the social importance that formal schooling has traditionally enjoyed, less information is available on non-formal education.

Another external source of information consists of the meetings organized by a ministry's departments and the professional meetings held in the education area. In departmental meetings, specific topics are selected for discussion, and advisers to State secretariats of education, advisers from the National Centre of Human Resources, and a few professionals and university professors are invited to attend. These meetings serve the purpose of gathering less rigorous but more qualitative and updated information on the issues discussed, of presenting problems arising from the implementation of plans, and of suggesting and informally analysing possible new policies for educational development. Likewise, the attendance at professional meetings on education by advisers to planning agencies serves the purpose of obtaining similar information. Current policies of these agencies seem to encourage this attendance, since the participation of experts during the last few years has been increasing.

The approach adopted in following up the projects being implemented has sometimes been called a managerial approach to education. Information on inputs and outputs is obtained from the agencies carrying out the projects, and the major evaluative criterion used is whether the targets have been (will be) met or not. Issues related to the overall educational policy underlying these evaluations typically are not dealt with. The same applies to some of the implications of the policies pursued. Similarly, qualitative aspects of the projects usually do not receive much attention in these evaluations, except when they are translated into measurable targets.

The internal evaluation of a project leads to a decision on whether or not the project is achieving its aims. The major concern is with productivity and efficiency and these decisions are made by the experts involved in the evaluation. An external evaluation of a project involves an assessment of the effects of the project on other projects and particularly on society at large. The kind of evaluation performed on educational projects in the Brazilian planning system usually fits the former category and thus conforms to a techno-rational model of decision-making.

External evaluations would fit the a-rational model of decision-making since they involve criteria which are not scientific or technical, like equality of opportunity and social mobility. Therefore, it appears that the sort of evaluation performed is partly dictated by the type of information available. Little qualitative information is supplied and, accordingly, qualitative aspects of education, when accounted for, comprise a small section of the evaluation reports. However, the almost exclusive concentration on internal evaluations apparently is the outcome of a political decision. Since most of the issues involved in this type of evaluation have a political content, it appears that decision-makers at the political level (i. e. government officials) prefer not to involve experts in this process.

The emphasis on internal evaluations rather than on external evaluations reflects the rationale underlying the overall development model that is chosen for society. In Brazil, the main concern of this model is with productivity in the economic sector and with efficiency in the operation of other sectors of the socio-political system. Concern with equity and the equity implications of efficient processes often play a minor role—if any—in the overall development model. This rationale is reflected in the priority given to internal evaluations, where the effects of a project on different social groups and on society at large are not considered.

Carrying out external evaluations in addition to internal evaluations would require additional resources. Given the budget constraint and a current policy of concentrating on internal evaluation, to pursue the other kind of evaluation implies reducing the scope and depth of present evaluation practices. None the less, the decision regarding the trade-off between these two is an a-rational type of decision. It involves assigning a weight to the information obtained on the internal operations of the educational system and comparing it with the value of information on the social effects of this operation. Current practices suggest that the former is highly valued and the latter is not.

It is not known whether such evaluations are routinely performed. The small number of documents on external evaluation of projects and the small amount of space devoted to it in educational plans suggest that this is not a common practice. On the other hand, this defines a set of implied decisions regarding the overall planning model. This model manifests a major concern with the efficiency of its relationships with other sectors of the socio-economic system, instead of a major concern with the social issues that typically surround the educational sector.

Decision-making models in educational planning in Brazil have a substantial non-technical component. But the major issues addressed in the country's planning activity are efficiency-related (a technical component) rather than equity-related (an a-rational component). The explanation for this apparent paradox lies in the fact that the choice of efficiency issues at the expense of equity issues is in itself an a-rational decision.

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7 Ghana

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The background

The communicative act is essential in all types of human or social organizations from the most basic to the most complex. Education is a human organization; hence the relevance of information and communication to policy formulation and planning of the educational enterprise. As organizations become more complex, the need for relevant information and appropriate communication techniques, patterns and channels becomes more urgent. It is this need which has given rise to a critical appraisal of the processes of identification and analysis of national patterns of information flow in educational policy and planning and to the relative impact of such information on decision-making processes at the various levels of responsibility.

Besides, information flow is essential in any human organization not only for its functional role but also for its symbolic and psychological aspects. The flow of information is significant for what it implies, triggers or controls. More information does not necessarily mean better communication. Unrestrained communication tends to produce 'noises' in the system. In the context of education, a certain degree of planned, consistent and relevant information communicated through appropriate channels is essential for the efficient and effective running of the system.

The nature of man as a rational social being with certain human drives has a bearing on the efficacy of information flow and communication in the educational enterprise. Some of these human drives are a sense of personal worth or self-esteem, the desire for status, approval, curiosity, creativity, recognition as a unique person who counts for something as an individual, and encouragement of one's sense of initiative and the desire to be consulted and to achieve self-fulfilment. The purpose of communication, both verbal and non-verbal, is to stimulate these drives, already strong in man. This fact recognizes the importance of a two-way process in the flow of information between the user and producer of information. The sharing of information with people who will be affected by the consequences of educational policy and planning helps to harness their motivational forces which engender co-operation attitudes on their part.

At the planning level, the establishment of an effective communication system and the free flow of information can help to create a frame of mind that is conducive to harmony between planners and practitioners, a sense of involvement and commitment to the achievement of clearly defined goals and consequently to higher productivity. An effective way of establishing confidence in an organization and mutual trust among the members of the various sections is by encouraging a tradition of regular communication, both vertically and horizontally.

Information is taken to imply items of knowledge and ideas, while communication does not only imply transmission of information, movement of persons and exchange of ideas, but the sum total of the symbols, both verbal and non-verbal, of social intercourse, such as messages, gestures, attitudes and behaviour. Communication is an essential ingredient in every development process.

A policy implies making fundamental choices. It is a proclamation which seeks to reflect the needs and interests of both citizen and State, as well as their hopes and aspirations. Educational policy should include political objectives corresponding to the major political options of the political leadership, and the socio-economic objectives as determined by the goals of the community which the educational system is purported to serve. It serves as a framework of action for the entire spectrum of education, its structure, content and methods.

In order to achieve the goals of educational policy, it is necessary to work out a plan for their achievement over a given period of time and with indications of resources available. Educational planning envisaged as a continuous process comprises diagnosis, forecast and preparation of the plan proper. It implies a combination of ways and means of bringing into reality policy objectives and targets. As the execution of the plan proceeds, a performance evaluation is conducted which can form the basis of continuous educational reform. The existence of good information and communication systems is central to the overall concept of educational planning.

Educational policy and planning must be seen to be a constant process of mutual correction. Policy has to take its bearings from planning and planning must absorb the results of practical work at the operational level of the educational system. Further, planning must be subjected to constant revision and bear scientific analysis, if it is to avoid becoming rigid and dogmatic.

Statement of the problem

Against this background the problems of identifying and analysing national patterns of information in Ghana and the relative impact of such information on decision-making and educational development at the various levels of responsibility must be examined.

The design of educational policy as envisaged in this presentation implies that policy objectives should be deduced from the broad framework of overall national goals and integrated with those adopted in the other sectors of national life. In designing educational policy, how can we take into consideration various dominant philosophical and ideological groups and shades of opinion within the general public?

In Ghana, every major political change has been accompanied by educational reforms which reflect the ideological orientation of the new political leadership. The period of transition from colonial administration to self-government by African leaders was marked by the launching of the Accelerated Development Plan of 1951 which provided a basic six-year education for every child of school age. The Second Republic of 1966 established the Education Review Committee of 1967. The present regime started with a series of committees to review various aspects of the educational system culminating in the publication of *The New Structure and Content of Education in Ghana* and *The Re-structuring of Teacher Education.*

At the national level, the requisite information for designing educational policy has been obtained by the setting up of a commission or comimttee of people representing a cross-section of the population with clearly defined terms of reference by the government. The appointment of the committee, its terms of reference and venue are published through the mass media.

The expectation is that all segments of the population and professional groups who are knowledgeable about education will present their views to the committee, by personal testimony before the committee, by memoranda, personal letters to the committee and the press and by group discussion, debates, interviews in the radio and symposia. The views collected from these sources are then collated and discussed and proposals for future educational policy are made to the government.

The adoption of the committee's proposal for educational policy is a political decision. The government's views are embodied in a White Paper which invariably accompanies the publication of the committee's report. The White Paper indicates which proposals are acceptable to the government, what policy it intends to follow, based on the tradition and prestige of particular types of institution, the needs of the country's industry and culture and the government's own political orientation and philosophical leanings.

The Ghana Education Service Decree, 1974, vested the power of 'drawing up educational policies and programmes' in the Ghana Education Service Council which is the governing body of the Ghana Education Service. The council is made up of eleven members appointed by the government for their interest in education. Two of the members represent the religious denominations and there are two *ex officio* members, the Senior Principal Secretary, Ministry of Education and Culture, and the Director-General of the Education Service.

Policies designed by the council for the education service are based on the personal observation of members, criticisms, observations and views expressed in the press and radio, petitions made by members of the service and views expressed at the Conference of Directors of Education who are either in charge of regional education offices or responsible for specific schedules at headquarters in Accra. It is not uncommon to read in the minutes of the council that there is a communication gap between the council and members of the service. The policy decisions of the council are conveyed to the service for executive action.

Educational policy serves as the framework of action, but policy objectives must be planned and translated into concrete goals and operational terms. This process of planning involves, among other things, identification of human and financial resources likely to be allocated to the realization of goals, and the ability to envisage alternative ways of achieving policy goals. This responsibility is discharged by the Directorate of Planning within the Ghana Education Service which is headed by a Director of Education. The functions of the director are defined as follows:

1. Keeping the administration informed of the priority objectives and functions of the educational system and its subsystems (including each level, institution, grade, course, class, etc.).
2. Presenting the best of alternative possible ways of pursuing various objectives and functions of the educational technologies, their relative costs, educational effectiveness, etc.
3. Advising on the resources at the disposal of education—real and functional—and the amount it can absorb at any time.
4. Advising on the distribution of the burden of educational costs and sacrifices.
5. Advising on the allocation of resources among different levels, types and components of the system (primary, technical and general, buildings, equipment, scholarships, textbooks, etc.). In sum, advising on the efficient (high-rate-of-return) performance of the educational system.
6. Production of short-range and long-range educational plans.

It is evident from the job description of Director of Planning that the information required for educational planning should consist of a balanced co-ordination of operations between personnel, machinery and procedures to provide a rational basis for decision-making.

The Directorate of Planning relies for its information primarily on the Unit of Statistics in the Ministry of Education and Culture which collates data from all levels of education and types of institution within the country on the demand and supply diagnoses such as: (a) enrolment of school population at all levels and types of educational establishments (this represents the demand from society for education); (b) supply of personnel, both teaching and non-teaching; (c) activities, both pedagogic and non-pedagogic; (d) buildings and equipment; and (e) costs and financing. The activities of the directorate involve accurate data on the existing educational system being assembled and assessed; an outline of a programme of aims and objectives being achieved; and a comparison of stated objectives of the plan and the actual outcomes after the execution of the plan and evaluation of the plan. At this stage possible mistakes in the planning and execution of the plan are ironed out for future guidance. One function of the national administration is the transmission of decisions and directives to the regional and district administration by means of circulars.

Information on policy and objectives, norms and standards, national plan preparation, drafting legislation and overall control and supervision is the responsibility of the central administration at the national level.

At the regional level, the director elaborates regional plans, programmes and projects in accord with the national plan; co-ordinates regional resources and implementation of the plan and participates in national plan preparation by providing this information at the regional level. The regional plan embodies data on institutional or school administration within the region, its organization and control; on district educational administration for the supply of educational goals and services; and on accommodation, staffing, equipment, etc.

To ensure effective planning at the regional level, the channelling of vertical and horizontal communication is essential in the following areas: (a) the central administration and the regional administration; (b) the regional administration and educational establishments, the district educational administration and the community generally. This need raises the problem of a centre of data and information on educational development in the region. The information flow for policy design and planning should not only be relevant and appropriate for its intended purpose but also consist of the collection, classification, storage, processing, utilization and dissemination of data organized and geared closely to the achievement of defined educational policy objectives.

The existing information system in education in Ghana does not meet all the requirements which have been outlined and often constitutes obstacles to educational development. Information flow is often haphazard, inaccurate and disorganized with much overlapping and repetition. Data are collected which are not directly related to decision-making and achievement of educational objectives. Non-utilization and dissemination, and inability to interpret data lead to bottle-necks in the design of policy and planning. It is not surprising that public pronouncements and the press not infrequently refer to the soaring cost of education and the need to maximize returns to educational expenditure.

Possible lines of action

The most important socio-political requirement for Ghana, and perhaps most developing societies, for educational planning is that of allowing for equality of opportunity for all classes of people, for the diversification of the content and type of education must take account of local data, individual and national needs and expectations. Educational plans can be designed to achieve these objectives on the basis of a strong administrative infrastructure, especially in the information system which is capable of providing required data at given points in time for making rational decisions and taking corrective action. Improved speed, detail and accuracy of information supplied are essential to effective planning; so are the rationalization of data processing and communication systems to ensure that more relevant information is more quickly communicated to policy-makers, planners and the general public. For the preparation of a rational, practicable and meaningful plan depends first on the availability of defined objectives and accurate data, efficient information and communication systems.

The flow of information for planning is especially necessary at this time of increased desire for decentralization of educational administration and local participation in planning and the related need to attain uniformity in classification and coding to enable comparative evaluation.

There is a need to strengthen the existing Unit of Statistics in the Ministry of Education and Culture by training existing staff to update their knowledge and competence; the provision of the necessary equipment; the establishment of an Analysis Unit with responsibility for analysis of eixisting stores of information; identification and enumeration of existing information; identification of sources of information; and collection, storage, processing and dissemination to users. There is a need for these processes to conform to an international pattern in order to facilitate the distribution and use of information, both national and international.

8 Kenya

Kabiru Kinyanjui

Introduction

In Kenya, the usefulness and relevance of policy research in decision-making and planning is well-known despite the problems which exist in the communication of available knowledge. A clear example of the interaction between government policy and social science research was the launching in 1970 of the Special Rural Development Programme (SRDP) with the Institute for Development Studies providing the major research component.[1] The purpose of this programme was to accelerate rural development in a few selected rural districts in Kenya. The research input was intended to help in identifying bottle-necks in developmental planning and implementation, experimenting with new strategies of imparting information and innovations for agricultural change, and in the final analysis to show through ongoing evaluation how the experience gained in the pioneering areas could be replicated in other parts of the country. The experience gained in the interaction between government planning machinery and the social science researchers in this particular programme has been well documented in a number of papers and in two overall evaluation studies carried out in 1972 and 1975.[2]

We mention the rural development programme because this is one of the sectors where the research component for policy and decision-making has been concentrated and persistent since independence in 1963. In addition to this applied research for rural development, the Kenyan Government has recognized in other sectors the benefits which can accrue to policy-makers from research findings and information emanating from within and outside the public sector. The University of Nairobi through its research institutes and departments has played a prominent role in the production and in many cases the dis-

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1. See 'Principles, Objectives and Strategies' in *An Overall Evaluation of the Special Rural Development Programme*, 1972, p. 1–22, 1972 (IDS Occasional Paper No. 8).
2. These are two evaluations entitled *An Overall Evaluation of the Special Rural Development Programme, 1972* and *An Overall Evaluation of the Special Rural Development Programmes 1975* (IDS Occasional Papers Nos. 8 and 12).

semination of information needed for policy decisions. This is now noticeable in fields like education, agriculture, social welfare, housing and administration. Some of the research findings are therefore being used by planners and administrators in their decision-making or have found their way into government documents.

Although the rural-development programmes include research on ways and means of improving education for rural populations, in the field of formal education, which is the main focus of this chapter, the process of incorporating social science research findings into policy decisions or into the preparation of educational policy has been slow. Since independence, the educational planners and policy-makers have tended to concentrate on the urgent and incessant public demands for the expansion of the education system. The pressure for the expansion of educational opportunities tended to preoccupy the time and the energies of policy-makers to such an extent that the benefits of educational research were largely ignored. However, in the last seven years educational planners and administrators have recognized the role which educational research and researchers can play in formulation of policy, planning and implementation of educational goals and objectives.

Recent experience in Kenya has shown that educational research and information for policy has become well established not only in the areas where there have been less urgent and pressing problems, but also in fields where the focus of public attention has been serious and sensitive. Consequently, policy research has been concentrated, and with some measure of success, in the field of curriculum development, examinations and the selection process for higher education, employment and training. These areas have been sensitive and the attention which the administrators and the researchers have given to finding solutions to the problems encountered in the last ten years is a clear indication of what educational research can do in improving the effectiveness of educational policy. In some of these areas, research is now an integral component in the process of policy formulation and implementation. Here, the roles of researcher and implementor have in most cases become one. We shall be saying more about the involvement of a researcher in the process of implementation later on.

The educational research referred to above is related to the internal efficiency of the educational system. Research has also been carried out on the functioning of the educational system in relation to other social institutions and has had some impact on educational policy and programmes. An example is the work on unemployment of school leavers which has an obvious influence on curriculum changes in Kenya.[1] This and other policy research related to education will be discussed here.

This chapter is divided into four main parts. The first deals with the main sources of educational research findings and information while the second deals with the main channels of the communication of this information to education policy-makers. The third part gives one case-study of how research has affected educational policy. The purpose of this case-study is to highlight the research dissemination/implementation process. In it we shall attempt to show the factors which influence the implementation or non-implementation of research findings. Following very closely the discussions on the case-study, the fourth part will deal with the politics of educational research and policy. We shall attempt to highlight some of the political problems related to choice of educational research problems, dissemination of information and implementation. In doing this, we hope to deal with the whole process of production, dissemination and utilization of educational knowledge in the context of an African country.

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[1] Kabiru Kinyanjui, 'Education, Training and Employment of Secondary School Leavers in Kenya', in D. Court and D. L. Ghai (eds.), *Education, Society and Development: New Perspectives from Kenya*, Nairobi, OUP, 1974.

Sources of educational research in Kenya

The main sources of educational research and information in the country are the Kenya Institute of Education (KIE), the Institute for Development Studies (IDS) and the recently created Bureau of Educational Research (BER). The KIE is part of the Ministry of Education, although enjoying semi-autonomous status; the other two institutions are part and parcel of the national university. In addition to these three institutions, there are other sources, institutions and individuals, who are involved in the process of generating educational knowledge and information for academic as well as policy concerns. The research projects covered range from pre-school to non-formal education. It is therefore important to bear in mind the contribution other sources of educational research findings make to social policy. Although there is a tendency towards duplication and lack of co-ordination of educational research activities, projects carried out in all these institutions do to a large extent complement each other.[1]

It can however be said that the three institutions have played a leading role in the production of educational knowledge for educational policy. The expectation is that they will continue to play an ever-increasing role in educational research. As we shall see below when discussing each of the three institutions, the emphasis on the type of research is different for each of the institutions, although the tendency, by chance rather than conscious planning, is to be complementary.

In the early 1960s the two main concerns of educational research were directed towards changes in curriculum and in the field of child growth and development. The need for curriculum changes in the 1960s was necessary and urgent if the colonial curriculum was to be changed to come into line with the political changes which were taking place. This has continued to be an important concern of the inspectorate of the Ministry of Education.

The concern for research in child development stemmed from a gap which existed in the understanding of the development of an African child in his social milieu. The *Kenya Education Commission Report* of 1964 strongly urged research in this direction when it stated 'that systematic studies of the African schoolchild should be undertaken by the research organization [Institute of Education whose establishment was recommended] as a matter of high priority'.[1] It was thought this would help in the transformation of teaching methods and particularly in orienting them towards a 'child-centred' approach.

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[1] David Court, *An Inventory of Research on Education in Kenya*, 1971 (IDS Discussion Paper No. 108).

These two policy concerns of the early 1960s influenced the merging education research institutions and the kind of research carried out therein. The curriculum development research led to the emergence of the Curriculum Development Research Centre (CDRC) in 1966, which later was merged with KIE. The child development research led to the establishment of the Child Development Research Unit (CDRU) which later was incorporated into BER.

Below we shall briefly discuss the kind of research carried out in each of the three main educational research institutions in Kenya.

THE KENYA INSTITUTE OF EDUCATION (KIE)

This institute was started in 1964 as part of the Ministry of Education. From the initial stages, the institute has combined a number of functions related to training, experimentation and testing of new curricula materials and educational research. Despite its varied orientation, its main function has been in the field of curriculum development, particularly in the field of publication, modification and improvement of syllabuses.

Initially the institute's task was that of merging three centres which were involved in educational experiments in the country. These centres included the special centre which was concerned with the techniques of teaching English which was part of the national experiment on New Primary Approach or the English medium as it was originally called. The science centre was concerned with the the improvement of teaching of science and the provision of apparatus for science subjects. The third centre was concerned with experiments going on in the teaching of mathematics. The merger of these three centres led to the formation, in 1966, of CDRC, whose mandate was

> to develop primary and secondary teaching materials and teaching aids; to try out these materials and aids in selected schools; to conduct in-service courses for teachers and tutors; to improve the quality of their teaching . . .[2]

The evaluation and testing of materials and familarizing schools and colleges in Kenya with them were the other tasks of CDRC.

This approach has been the main *modus operandi* of this institute. When the KIE assumed its full standing within the Ministry of Education, CDRC ceased to exist as an entity. However, in the 1974-78 Development Plan it was stipulated that the function of KIE in the field of teacher's education would be transferred to the inspectorate and that the institute would assume a greater responsibility in the field of educational research and information. The development plan had this to say:

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[1] *Kenya Education Commission Report*, Part I, paragraphs 479–82, 1964.
[2] Kenya, Ministry of Education, *Annual Report for 1966*, p. 26–7.

> Curriculum research and development will be conducted by the Curriculum Research and Development Unit (CRDU), operating on site of the present KIE. CRDU will be an action-oriented unit able to take on projects of all types in fields as divergent as primary language training and practical agricultural science.[1]

The past role of KIE has been curriculum development and, from what is stipulated in the Development Plan, it will remain the same. In other words, the institute has been and will remain an important instrument of the Ministry of Education for initiating and implementing changes in the curriculum. In this respect KIE has contributed enormously in the generation of research and information needed for educational policy and objectives. The efficiency and effectiveness of this institute cannot be judged here but it will suffice to say that it is an important producer and disseminator of educational information.

Another development which will strengthen the production and consumption of research findings will be the establishment of the Examinations Research and Development Unit with the task of evaluating all the existing examinations and selection procedures. It will give priority to the Certificate of Primary Examination, so that this examination can become efficient, equitable and attempt to influence the content and methodology of teaching in Kenyan primary schools.

The establishment of a research unit in the examination section and the reinforcing of the role of KIE in educational research are other clear indications of the increasing importance being given to research findings and information in the improvement of educational efficiency and in educational planning as a whole. BER (discussed below) was established with one of its functions being to 'carry out specific projects on behalf of the Ministry of Education'. This expectation once again emphasizes the increasing importance of research findings in educational practice.

THE BUREAU OF EDUCATIONAL RESEARCH (BER)

The Bureau of Educational Research was formally established as a department of the Faculty of Education at the University of Nairobi in February 1975. The 1974–78 Development Plan suggested the establishment of the bureau as one of the supporting services for the Ministry of Education. Thus among its main functions the bureau was expected to carry out research on policy issues and to evaluate ministry projects.

In terms of research orientation, the bureau inherited the concerns of its predecessor, the Child Development Research Unit (CDRU). Since the inception of CDRU in 1967, it had been preoccupied with research on child development. The concern of this research was not to influence policy in Kenya, but to meet scholarly requirements set at Harvard University (the unit was funded by the Carnegie Foundation through a grant to Harvard). The unit provided American scholars and graduate students with opportunities to carry out studies which in most cases were intended for the American academic audience. In other words, the unit paid very little attention to the concern which was expressed in 1964 by the *Kenya Education Commission Report* on questions of child development research which could enrich the teaching of African children in primary schools. Therefore the research carried out at CDRU up to 1974 was not intended to benefit the policy-makers or bring improvements in primary education in Kenya. Kenya was one of the countries where this kind of research was carried out, and benefits to its education system were peripheral to the concerns of the American scholars who were in charge of the unit.

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[1] Kenya, *Development Plan 1974–78*, p. 434–5.

Although the bureau initially committed itself to build upon the work previously carried by CDRU, it has however widened its concerns and priorities to come in line with its mandate and to meet the increasing demands of the educational system. The bureau's research programme is now concerned with all levels of formal education and out-of-school educational programmes. The research carried out by the bureau since 1975 shows an attempt to break away from the inherited limitations of child development research and have a broader perspective. Some recent concerns have been rural education, spatial development of education, education for women and evaluation of day-care centres in Kenya. Most of these projects have been carried out with clear intentions to influence policy and decision-making in government and interested groups.

The bureau has shown a keen interest in disseminating the research findings and information available to it. Its contribution in terms of the materials provided to the National Committee on Educational Objectives and Policies (NCEOP) attests to this concern that dissemination of research findings should reach policy-makers. The bureau's potential to make a contribution to policy research is there provided research personnel and financial backing are available. This possibility carries with it the danger that the bureau might become an instrument of legitimizing the decisions and policies of educators. Often this is something bureaucrats in Africa would like to see happen in our universities, but it is a trend which must be resisted by researchers and other academics. The autonomy of researchers from bureaucratic control remains a critical issue in our universities.

THE INSTITUTE FOR DEVELOPMENT STUDIES (IDS)

The Institute for Development Studies which was established in 1965 as a social science research faculty of the University of Nairobi is the largest single research institution in Kenya, and one of the leading in Africa. From the beginning, the institute's emphasis was on multidisciplinary and multipurpose policy-oriented research. Hence the bulk of the institute's research programme has been oriented towards policy issues. In other words, the institute has carried out research for the government and particularly in the field of rural development which we referred to in the introduction to this chapter.

The institute's concern with education research problems started in 1967, when research into the role of Harambee secondary schools in the development of education in Kenya[1] and into the economics of a programme of loans to students to finance university education was initiated.[2] Since then research on education has emerged as an important component of the institute's social policy research. A breakthrough in the field of educational research was however made in 1969 when the Secondary School and University Leavers Tracer Project was launched. The main aim of this project was to influence education planning by generating information which could be useful in career guidance and placement, curriculum development and the selection process.

From the policy outcomes that originated from this project, it can be shown that this is one of the major policy research projects outside KIE which has had a real impact on educational innovations in the country. During the period 1970–77, its findings were incorporated into a career guide and career information sheet for school leavers and it was instrumental in initiating computerized selection procedures for secondary school leavers going into higher education, training and employment. We shall have an opportunity to say more on this research and its policy outcomes later.

Although research on secondary school leavers has been the dominant concern of researchers working in the field of education, research related to education and development has become one of the major five or six areas of the institute's thrust in social science research. In other words, in the last six years research on education has become a major programme in IDS. Most of this research has been mainly policy-oriented, and has influenced innovations in the Ministry of Education as well as being incorporated into some government policy documents.

IDS still carries out research on educational policy issues, some of the current ones being: the structure of pre-primary education and its relationship to access to primary education in Kenya; participatory research on problems of adult literacy in rural Kenya; the distribution of educational resources and opportunities in Kenya; and the development of primary schooling in a number of rural districts in Kenya.

The number of educational projects at IDS at any time depends on the number of researchers and funds available. The choice of areas and actual projects to be covered depends to a large extent on the inclinations, interests and skills of the researchers. The interest of governmental policy-makers and the public in general also influences the educational researchers in their choice of research problems.

A tribute to the contribution IDS is making in social science research was the way in which work carried at the institute was utilized by the ILO Employment Mission to Kenya in 1972. On many other occasions, IDS staff have acted as consultants to government committees and commissions. Recently, four IDS educational researchers were appointed as the main consultants of the National Committee on Educational Objectives and Policies (NCEOP). In addition, a number of staff members were requested to prepare papers for NCEOP.

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[1] For influence of this research on policy, see John Anderson, 'The Harambee Schools: the Impact of Self-help', in R. Jolly (ed.), *Education in Africa, Research and Action*, Nairobi, East African Publishing House, 1969, and the *Report on the Conference of Harambee Headmasters*, 1966 (IDS Discussion Paper No 95).

[2] This research into economic aspects might have influenced the government plans to start financing university education through a student loan system, a scheme which was started in 1975.

The potential for IDS to continue generating educational research findings for policy and planning is there, provided researchers and policy-makers make full use of it. There is however the danger that the educational researchers will be too preoccupied with policy research and neglect fundamental research which will make contributions to theoretical work in education. This theoretical work in education research is in a state of underdevelopment at IDS and is a major weakness of educational research so far undertaken.

Channels of communicating research findings and information

Channels are methods of communicating research findings and information from researchers to practitioners and potential users. The users could be policy-makers in the government or private sector, academics or the public at large. Communicating research knowledge to potential users is one of the critical issues facing social policy researchers in a country like Kenya. The gap between the researcher and the policy-maker remains a critical bottle-neck in the utilization of research findings. In Kenya, this problem has been discussed in a number of workshops, but despite these discussions it remains serious. As research output of various institutions increases, the dissemination and utilization of knowledge generated therefrom continues to be a pressing problem for researchers and policy-makers. Unless, therefore, channels are found and utilized, the research knowledge being acquired and accumulated in research institutions all over Africa will remain useless to the national policy-makers and other users who require it.

Thus the manner in which research knowledge is disseminated is to a large extent a critical factor in the utilization or non-utilization of research findings. This realization has led a number of social policy researchers and research institutions to deliberately incorporate the element of dissemination in the design and execution of the entire research process. In other words, research is formulated in a manner making the process of dissemination to the anticipated target groups easier. BER at the University of Nairobi has clearly articulated one of its functions as that of dissemination of educational information to interested target groups. IDS has in the last five years been seriously concerned about the dissemination of research findings which it continues to accumulate.[1] This concern with communication and applicability of research findings has become so strong that it tends to obscure the necessity and usefulness of fundamental research which might have no immediate policy implications. The preoccupation with acceptability of research findings by policy-makers has also encouraged a less critical examination of government policy and the problems facing the society. If this trend continues in all research institutions, an important element in the production of knowledge in the African countries will be underdeveloped at the expense of instant social policy research.

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[1] In 1972 and 1973 for instance, the IDS with the support of the government and international agencies organized two workshops on this issue. See the reports of these workshops: *Harnessing Research for Production, Dissemination and Utilization*, 1972 (Occasional Paper No. 5) and *In Search of a System for the Dissemination of Research Findings and Technology in Kenya*, 1973 (Occasional Paper No. 7).

Below we outline a number of methods of channelling educational research findings which are being utilized by researchers and research institutions in Kenya. We intend also to point out the advantages and problems with each approach.

CONVENTIONAL ACADEMIC APPROACH

The usual method of disseminating research findings is for researchers to address themselves to their colleagues in academic circles. This is done through scholarly journals, seminars and conferences. The audience is small, whether local or international. The main concern of the researcher here is for the advancement of his career and academic knowledge. Whether his research findings are utilized or not does not concern him a great deal. The concern is whether his work stands up to the scrutiny of the other scholars. This is one of the problems facing African scholars and particularly those looking for international reputation and acceptability. They find that addressing themselves to the local audience limits their academic career and the possibility of international mobility.

This approach to dissemination is widely used in institutions like IDS and BER. IDS in particular has been dissemination most of its research findings through working papers (unfinished products), discussion papers (final products), monographs (occasional papers) and books. Seminars, workshops and conferences have also been mediums of communicating research findings. The target group of this approach is mainly the academic staff. Although the policy-makers are also involved, the orientation of papers is usually directed towards the academic community, both local and international.

The potential audience of these papers is limited by its form of dissemination and the language used—usually academic jargon. The advantage of this approach is usually to the researcher and the academics who utilize his research for teaching purposes. The policy-makers and interest groups usually find this approach alienating and mystifying.

Unless the issue of dissemination to a wider audience is considered and practical solutions are found, then the above approach has limited usefulness to policy-makers or interest groups. Use of other media—newspaper discussion and public lectures—can go a long way to remedy this situation.

RESEARCHER/IMPLEMENTOR APPROACH

This is an approach whereby the researcher is involved in the whole process of production of research knowledge and dissemination and implementation of his research findings. The researcher does not have to be an official of the institution implementing his research findings, but has to be accepted by the decision-makers as able to play his many roles. The identification with and acceptability of the researcher by policy-makers is critical to the effectiveness of his work. Otherwise, being an outsider he can very easily be isolated and be left out on the decisions which affect the research findings to be implemented. Another critical factor in this approach is the acceptance not only of the research to be carried out, but also the research findings and their policy implications. Hence the changes and the innovations the researcher recommends must be acceptable in terms of costs and effectiveness and above all not be seen as threatening the power and positions of those implementing them.

This has been the approach adopted by Tony Somerset, formerly an IDS researcher, who has been involved in research on selection procedures for secondary school leavers and who was instrumental in carrying out innovations in this sector. We shall deal with this in more detail later. This is also the approach adopted by researchers who have been working in improving the efficiency, equity and effectiveness of the Certificate of Primary Education (CPE) examination in Kenya. The changes and innovations which have been brought about in these two levels of selection have mainly occurred because the researchers have been able to follow them through the stages of dissemination, experimentation and finally their implementation as permanent features of the educations system.

A major advantage of this approach is that the researcher has access to very rich and valuable data sources, which enhances his research capacity and effectiveness. This is an advantage which other researchers who have not won his kind of acceptance cannot have access to. This type of researcher has also another advantage, that is of seeing his research being discussed in policy meetings and consequently being incorporated in the process of planning.

A researcher of this kind is on the other hand under restrictions which are part of working conditions in government departments. At times the researcher may be required to maintain confidentiality which means he cannot discuss his data freely with his colleagues. In other words, his research might not benefit from criticism and suggestions of his fellow researchers. Another problem is that of identification of the researcher with the officials or the department he is working with. This can lead to loss of objectivity in the selection of research problems or the presentation of research findings. The researcher may be excessively concerned with maintaining good relations with the policy-makers, to such an extent that he may not engage in research or give recommendations which threaten the very structure he is working in. In other words, his concern with cosmetic changes might make him lose sight of the need for fundamental changes in the very system which is kept going by the inconsequential innovations he recommends and implements. This is a real problem for the policy researchers who turn out to be also the implementors of their research findings.

COMMISSIONED RESEARCH

This is the situation where a researcher or researchers are commissioned by a government, ministry or non-government agency to carry out a study or an evaluation of a particular project. Usually the terms of reference are determined by the agency which is commissioning the study, although in some cases the researchers are consulted before the final terms of reference are determined.

Here the researcher is required to produce certain knowledge which is needed by the commissioning authority. The researcher has nevertheless an opportunity to communicate the knowledge he will acquire in the process of his study or that which he has accumulated through other research activities. This can therefore be a unique opportunity for dissemination of research findings which might be accumulated previously on the topic of the study commissioned.

However, once the researcher has written his report and delivered it to the commissioning agency, he has no control as to whether the findings and recommendations of his study are implemented or not. There are, however, cases where the researcher might be called to translate his findings into policy—his role therefore becoming that of implementor. The report might also be classed confidential and the researcher as required not to disclose its contents. In such a case the report might not be implemented and the researcher may not publish his findings.

IDS has carried out a number of research studies of this kind and the influence of the researchers tends to be limited to what goes into the document that is produced. It is therefore hard to generalize on what causes findings of a commissioned research to be implemented. Each report has its own history, politics and costs to be taken into consideration. Our experience at IDS is that the enthusiasm shown initially when requesting an evaluation or a study is not usually sustained to the end and especially when the report is produced and recommendations for implementation are made. This in general is the history of the evaluations carried out by IDS on the Special Rural Development Programmes in Kenya in 1972 and 1975.

PARTICIPATION IN COMMITTEES AND COMMISSIONS DEALING WITH POLICY ISSUES

Research findings are disseminated through the participation of researchers in committees, missions and commissions which are charged with the responsibility of formulating policy recommendations. The participation of researchers in government, international and privately sponsored committees and missions is a world-wide phenomenon. In Kenya, it is common practice, particularly in government commissions.

An example of this kind of participation of researchers was the ILO Employment Mission to Kenya in 1972. Among the mission members were researchers drawn from both international and local research institutions. The quality of the final report, to a large extent, depended on the experience of the researchers involved; it had to draw very heavily on IDS research findings.

The writing-up of the chapters on 'Employment Problems among Particular Groups' and 'Education and Training' were influenced by educational researchers who were members of the mission and by research findings which were made available to the mission. In addition, the three technical papers in the ILO report on Kenya were written by educational researchers who had done their research at IDS.[1] In a way, this was a unique opportunity for researchers, and particularly those involved in the field of education, to influence the contents of an important document. This helped a great deal in disseminating research findings which had been accumulated by educational researchers for a period of some four years. Previously, the educational researchers' influence on government commissions was mainly limited to merely giving evidence.

Evidence of the increasing influence and participation of educational researchers in shaping educational policy is borne out by the appointment of a National Committee on Educational Objectives and Policies in 1976. Four members out of the twenty-four were drawn from the university, including one educational researcher. Although the composition of the committee had no strong representation of educational researchers, four of the six consultants to the committee were educational researchers based at IDS. In addition, educational researchers from IDS, BER and KIE prepared numerous background papers on educational issues that the committee was dealing with. What was quite clear in working with this committee was the acceptance of researchers as people who could contribute important information on issues of national importance. To educational researchers this was a unique opportunity to make their research findings known to senior policy-makers in education who were well represented in NCEOP. Although not all research findings were incorporated in the final report, the educational researchers were able to sensitize the educational policy-makers and planners to some of the recent research findings that have an important bearing on the educational system.

Below we shall give a case-study of a piece of educational research carried out at IDS whose findings led to innovations in the Ministry of Education. The process of dissemination and the utilization of these research findings by policy-makers is important in understanding how social science research can influence educational practice.

The impact of the tracer project on educational planning: a case-study

In 1969, IDS, with the support of the Ministry of Education, and later the Kenyanisation of Personnel Bureau, started a follow-up study of school leavers who had completed their secondary education in a national sample of schools. Before the tracing of some of the school leavers, questionnaires relating to

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1. See ILO, *Employment, Incomes and Equality: a Strategy for Increasing Productive Employment in Kenya*, chapters 4 and 14 and Technical Papers 23, 24 and 25, Geneva, 1972.

isocal background, educational attainment, career aspirations and knowledge about finding employment in the labour market were administered. Unfortunately, this background information could not be obtained for all the cohorts we were tracing, as the project was started when some leavers had already entered the labour market. This was the case for 1965-68 school leavers. We were therefore able to get social background data only for 1969 leavers.[1]

The aims of the study were to show patterns and rates of employment and unemployment of secondary graduates; and transition patterns into further levels of education and training. By carrying out this study, it was hoped to influence changes in the secondary school curriculum, to develop career guidance and placement schemes and to streamline the selection procedures for further education, training and employment.[2]

Although this study did yield very important data on patterns of employment and unemployment of school leavers in Kenya, findings which had an impact on educational policy,[3] our discussion here will focus on two outcomes of this study. These are the improvement of career guidance information and the selection procedures.[4]

CAREER INFORMATION FOR SCHOOLS

Up to about 1970, career information for secondary school leavers came from three principal sources. First, there was a career master who in each of the well-established schools was expected to provide up-to-date information on careers and to help in the placement of leavers. In most of the new schools this service did not exist. Second, there was a careers guide published under the auspices of the Kenyanisation of Personnel Bureau which gave students information regarding opportunities available in the labour market. This was supplemented by pamphlets from employers and training institutions. Again this kind of information was easily available in the old and well-established secondary schools in the country. A third method of informing school leavers about job opportunities was for the big employers to send their recruiting officers into schools to talk to school leavers. By 1969 this approach was being abandoned by many employers and those who continued with these services concentrated on a few schools in the urban and peri-urban areas.

The growth of secondary schools from about 100 in 1963 to 800 in 1970 created a crisis in the flow of information to schools. As the unemployment of school leavers (from 1968) became a serious problem, the uneven flow of information to schools created unequal access to the available opportunities by the qualified school leavers. A solution had to be found to deal with the problem of lack of career information in all schools regardless of whether they had career teachers or not.

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[1] See H. C. A. Somerset, 'Educational Aspirations of Fourth Form Pupils in Kenya', in Court and Ghai (eds.), *op. cit.*

[2] See Kabiru Kinyanjui, 'Education, Training and Employment of Secondary School Leavers in Kenya', *Education in Eastern Africa*, Vol. 2, No. 1, 1971.

[3] See, for instance, ILO, *op. cit.*, chapters 4 and 14, and also Kenyan Government, *Sessional Paper No. 10 of 1973 on Employment.*

[4] For this discussion I am greatly indebted to H. C. A. Somerset for allowing me to see a draft of his forthcoming paper.

The solution advocated by an educational researcher was to publish an annual *Careers Information Sheet* which contained up-to-date information on the available opportunities for further education, training and employment. This booklet is published by the Ministry of Education and distributed to schools in the third term of each year. Since the facts contained in the booklet are essential for filling in the career choice form, the booklet is distributed in all schools and each pupil is expected to read it.

The booklet informs the pupil of the qualifications (subjects and examination grades) needed for each opportunity. He is also told the likely number of vacancies for each opportunity and the number of school leavers who had applied in the previous year. This is particularly useful for opportunities in higher education and training institutions. In some cases information on starting salaries on entry to training or employment opportunities are given. In this way, the school leaver is given fairly adequate information on the available opportunities and the kind of competition he is likely to face in the labour market.

While students need information on the available opportunities, potential recruiters of school leavers need information concerning the students entering the labour market. This is important for the selectors if they are to choose the best available applicants for the limited opportunities. The information given to recruiters is obtained from students, teachers and the East African Certificate of Education (EACE) examination. The student provides personal data and his career choices and preferences. The teachers rate the students on character, leadership qualities and suitability for certain job opportunities. This information is punched into cards and when examination results are out, the EACE performance is matched by a computer to the other data and a print-out made for the selectors. This information enables the selectors to proceed with their selection.

The role of the researcher in this exercise was first to identify the problem and then to recommend possible solutions. The second step for the researcher was to work out solutions for the problem and then experiment with the solutions. The first *Careers Information Sheet* was published in 1971 and was accompanied by a careers form which was sent to pupils to fill in their preferences and teachers to assess their pupils. Since then, each year a new edition is published by the Ministry of Education. The researcher provides the data which are necessary for up-dating the booklet. He has also an opportunity to alter the booklet or the career form if he finds that improvements are needed. Changes are made as a result of feedback from evaluation of previous work.

The researcher had to a large extent to supervise the process of gathering new data for the next edition of the information booklet, and to see that the information from pupils was correctly entered into a computer to await EACE results. This went on until the time when the innovation was accepted by the Ministry of Education and personnel was provided to carry on with most of the tasks performed by the researcher.

In a situation like this, the researcher had to do the job for a number of years. If this was not done, then the innovation had slim chances of success. This meant that the researcher had to commit his time and energies to the success of this innovation, while other research work had taken low priority. A crucial factor in the long-term success of this project was the acceptance of this innovation and the establishment of permanent structures to carry on with the tasks when the researcher disengaged.

THE SELECTION PROCESS

This is part and parcel of the information system which we have described above. In the careers forms the student is given an opportunity to express his preferences for higher education, training and employment. The two categories of preferences are grouped under higher education and training and employment. Under each of these two categories there are other choices given to the pupils. For instance, under higher education the pupils can choose three schools in the order they are preferred and under training the applicants can choose between different categories of teaching, agriculture or medical-training opportunities. All these choices and preferences are coded and stored in a computer to be matched with EACE results.

Previously when school leavers applied for higher education and were not selected, they were not considered for other opportunities.[1] The existing system now has remedied this. The selection is carried out for higher education applicants and followed later on by selection for training and employment opportunities. Applicants who are not successful for higher school opportunities are considered for other opportunities for which they have indicated their preference. So no candidate is penalized for applying for a higher school opportunity for which he is not qualified.

For the selectors this new system provides them with the information which they require to select the best candidates in the labour market. And for the school leavers this system is efficient and equitable—an important factor in these days of rising unemployment.

The role of a researcher here was to co-ordinate the computerization of the information coming from pupils, teachers and EACE examinations. This information is easily available to selectors and organized in a manner that facilitates selection.

The main problem has been integration into Ministry of Education ongoing programmes. However, it is now an accepted programme of the Ministry of Education and has helped the efficiency of the selection procedures.

These innovations originated from the tracer research project of IDS. Implementation very much depended on the researcher. Once the policy-makers were convinced of the value to the educational system, they committed themselves to the successful implementation. This was a case where research findings had a direct influence on educational planning.

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[1] For detailed description of the old system, see E. R. Rado, J. Morgan and D. Shepard, *The Selection of Form Four Leavers for Further Education, Training and Employment*, 1970 (IDS Discussion Paper No. 94).

Politics and educational research and policy

The choice of a research problem and the knowledge that is generated from it are not a politically neutral process. The political orientation and class sympathies of the researcher to a large extent determine his choice of the educational problem to be researched, the methodology to be followed and the audience to which he addresses his findings. In this chapter, we might have given the impression that the political question is not an important one, and the major problem facing researchers and policy-makers is that of communication. The problems described in this chapter are to a large extent the problems of a social policy researcher as opposed to a researcher who is committed to advocacy research.

Policy research is directed at policy-makers with a view to influencing policies which might lead to social improvement or innovations in the system. Research on policy, rather than questioning of the social structure, aims at strengthening and smoothening the existing social situation. Although this type of research is interested in changes in the system, it does not question the very basis on which that system is built. On the other hand, advocacy research is interested in fundamental changes in the social structure which means a commitment to long-term solutions rather than those of a cosmetic nature. This kind of research aims at providing information and educating interest groups (potential or actual political actors) which are struggling to create new political alignments, and change power relations in the society. In the choice of a research problem of this kind the researcher has to bear in mind these considerations, which are in essence political decisions. The pure policy researcher also operates from these kinds of considerations although they may be implicit. The implicit considerations originate from commitment to the existing political and economic order.

In Africa there is a preponderance of social policy research while advocacy research is in a state of underdevelopment. This stems from the nature of political developments taking place in Africa. The ruling classes are not enthusiastic about research which questions the very basis of their political power. Funding from internal or external sources has also emphasized and promoted social policy research. So the state of backwardness of advocacy research in Africa stems largely from the political and economic context in which many researchers find themselves.

Although the role of advocacy research may seem insignificant in the present context, it is important to recognize its usefulness in bringing out information which is critical for social change, and which might not be acceptable to the classes in control of power. The documentation and dissemination of information on social problems which face society are important contributions to this type of research. As social differentiation in all sectors of African societies, including the education sector, becomes more entrenched, advocacy research will become all the more important in providing the struggling classes with the information and knowledge they need to counteract the dominating classes. This is the real challenge of research in Africa.

The researchers in the African situation have the option of allowing the ruling ideas to dominate their research enterprises, or to challenge these ideas in their own research. From this struggle, relevant research knowledge for the advancement and transformation of African societies will emerge.

Conclusion

In this chapter we have briefly dealt with the main sources of educational research findings and information in Kenya. We have also discussed the channels for communicating that information to policy-makers and have dealt with problems of research dissemination. We have also discussed, though rather briefly, the political orientation of most research in the African context. Here we have pointed out where research is underdeveloped and the direction which we hope future research will take.

We have, however, not dealt with issues like the quality of research produced, the adequacy of the methodology of the existing research work and the personnel problems in educational research. These are important issues in the production, dissemination and utilization of educational knowledge and information. We could not go into these issues here because of limitations of space.

We have therefore attempted to raise issues of relevance in the production and utilization of educational research for educational policy and planning. The author has drawn from his experience in Kenya; however, some of the issues raised in the paper are relevant to the overall African context.

9 Malaysia

Haji Ahmad bin Haji Saleh

The progress of education in Malaysia

In recent years, there has been a very rapid increase in the provision of educational and training services in Malaysia. This is largely due to the increased priorities accorded to education and training in the last two Five-Year Plans (1971–75 and 1976–80). Increases in government expenditure on education and training during these two plan periods have been slightly ahead of the growth of gross domestic product (GDP) which itself has averaged an impressive growth rate of about 8 per cent in constant prices.

Within the formal system of education, measures have been taken to extend educational opportunity and to render the system more practical and equitable. These measures include: the provision of universal free education for the first nine years; the provision of free tuition at the upper and post-secondary levels in all national schools; the introduction of pre-vocational subjects in the seventh to ninth grades; greater emphasis on science education throughout the education system; the progressive replacement of English by Malay, the national language, as the main medium of instruction; the extension of educational television on a national scale; the introduction of a textbook loan scheme; the increased provision of scholarships and bursaries; the expansion of facilities at tertiary level.

As a result of these measures, 96 per cent of the 6-plus age group enter the primary school and approximately 85 per cent complete the primary cycle (grades one to six) and continue their education at the lower secondary level (grades seven to nine). At the end of grade nine (or form III) the children sit for a public selection examination called the Lower Certificate of Education Examination. About 62 per cent of them are selected into the upper secondary level (grades ten and eleven). Finally, approximately 15.8 per cent of those who have completed the upper secondary level proceed to post-secondary or pre-university classes (grades twelve and thirteen). Selection is based on the performance of pupils in the School Certificate Examination.

At the upper secondary level, pupils are channelled into academic, technical or vocational streams. The percentage of distribution is shown in Table 9.1.

TABLE 9.1. Percentage distribution of academic, technical and vocational streams at the upper secondary level

	1974	1975	1976
Academic (arts and science)	92.5	91.8	85.8
Technical	2.3	2.5	4.6
Vocational	5.2	5.7	9.6

At the post-secondary level, pupils follow a two-year course either in arts or science subjects. The percentage of pupil distribution in the two streams is shown in Table 9.2.

TABLE 9.2. Percentage distribution of arts and science streams at the post-secondary level

	1974	1975	1976
Arts	46.9	48.2	53
Science	53.1	51.8	47

The increase in enrolment at the secondary level together with the steady growth in national and individual prosperity has given rise to a greater demand for higher education. Table 9.3 shows the rapid development in tertiary education between 1970 and 1975.

TABLE 9.3. Growth in tertiary education

Institutional level	1970	1975
College level		
Ungku Omar Polytechnic	394	1,136
MARA Institute of Technology	2,142	7,872
Tunku Abdul Rahman College	1,195	4,133
University Level		
University of Malaya	7,777	8,056
Science University	271	2,851
National University	169	2,562
Agricultural University	585	2,656
University of Technology	692	2,263
	13,325	31,529

Against this background on educational developments, an attempt will now be made to show the role of information in educational decision-making in Malaysia. This can best be done by describing briefly the educational administration and supervisory machinery and the planning process in the Ministry of Education.

Due to historical, political, economic and social evolutions and considerations, Malaysia opted for a centralized system of parliamentary government. Under articles 74 and 80 of the Constitution of the Federation of Malaysia, legislative and executive authority rests wholly with the central government.

The Education Act of 1961 vested in the Minister of Education the duty to establish, maintain and administer a national system of education satisfying the needs of the nation and promoting its cultural, social, economic and political development. It vests all property and power in the minister and under his direction, the Ministry of Education is organized into divisions and sections to administer and supervise schools, further-education classes, teachers and the universities throughout the nation.

The ministry's responsibility for the development of primary, secondary and other education includes the supply, training and supervision of teachers, the building of new schools and other institutions, the school health services, the special educational treatment of handicapped children, religious education, the administration of a textbook loan scheme, and the provision of scholarships and bursaries. Though the universities are autonomous under the provisions of the Universities and University Colleges Act 1971, these institutions are still answerable to the Minister of Education with regard to their programmes, policies and performances.

The administrative structure indicates that generally the heirarchy of administrative control rests first with the political head of the ministry who is the Minister of Education himself. He is assisted by two deputy ministers. However the direct administration rests with the Secretary-General, who works very closely with the Director-General of Education. Each is assisted by two deputies.

Below the level of deputy secretary-generals and deputy director-generals, the ministry is organized into various divisions such as the School Division, which is concerned with matters pertaining to primary and secondary schools and special education and the Finance and Accounts Division which is concerned with matters of finance.

Each division is responsible for collecting and disseminating information relevant to its functions. This basic organization enables the schools and other agencies and bodies concerned with education in various parts of the country to maintain continuous and effective contact with the ministry. To this end, each state in the Federation has a Director of Education who maintains direct contact with schools in his state and the ministry. All correspondence and commumunications to and from the ministry are channelled through him. This encourages the interchange of information and keeps the ministry advised and informed of developments which are taking place at the grass-roots level, thus permitting quicker and better decision-making when official sanctions are required.

With regard to the general procedures, all educational legislation is the responsibility of the ministry. Its annual financial estimates are presented to Parliament and announcements of major educational policy decisions are made there. Here again, Parliament itself provides a mechanism for the ministry to exchange information and ideas with other agencies and the public at large through the elected representatives of the people.

After the ministry has defined national policy with the approval of Parliament and made regulations prescribing the essential requirements which must be met, it has the task of securing effective execution of the policy and the satisfying of these regulations. This is largely implemented through circulars and directives issued to the directors of the state education departments, as well as regular conferences of the heads of divisions and the state directors of education.

The thirteen state directors of education have the task of carrying into effect, in the schools under their charge, the policies which have been referred to earlier and of co-ordinating and supervising the education services of the state.

In very broad terms, the functions of the state education departments fall into five main categories:

1. To administer the Education Act 1961 on behalf of the ministry.
2. To execute government policy with regard to admission of children and the employment and service of teachers.
3. To organize and maintain direct contact with schools, teachers and other professional bodies.
4. To advise the ministry whenever necessary on the steps and changes derived as a result of (1), (2) and (3).
5. To supply all information and statistics on all educational programmes in the state to the ministry and disseminate all information from the ministry to the local level.

Supervision is also carried out by the Federal Inspectorate of Schools which at the same time provides feedback on the implementation of the programmes. This body holds a general conference once every year.

To increase the effectiveness of planning at the ministry level, in 1963 the Ministry of Education established the Educational Planning and Research Division (EPRD). EPRD has the requisite machinery for a systematic collection of educational information and statistics and public and official opinions for use in planning and research in education and training. In carrying out its planning and research activities, EPRD works closely with the National Development Planning Council (NDPC) and the Economic Planning Unit (EPU) of the Prime Minister's Department, as well as with other public and private educational institutions and bodies.

As far as educational planning is concerned the ministry plays a national role, and educational information is viewed not only as a part and component of the educational system, but also as a part of a broader national information system covering other fields.

The ministry also makes provisions for the gathering and dissemination of up-to-date information on educational development in other countries; this is considered when reforms and innovations are formulated.

In general, the existing planning process goes through several stages. First, directives are received by the ministry. These are set by the highest political authority in accordance with general policies in the political, economic and social fields. The preparation of the draft plan is handled by EPRD in consultation with the various operating agencies and is then submitted to the Educational Planning Committee (EPC) of the ministry for its approval. It is then finally reformulated and sent to EPU for its sanction. Thus approved, the plan is ready for implementation.

As mentioned earlier, in making decisions on educational proposals and plans, consideration is given to the views of the state education authorities, voluntary agencies, private institutions, and teachers' organizations, as well as to the reports and recommendations of specially appointed commissions and committees. In short, educational data and information play a significant role in all the decision-making processes.

Importance of educational data in decision-making

Sound and effective educational planning depends very much on the reliability, validity and comprehensiveness of the educational data available. The planner will not be able to work out a good strategy if the appropriate educational data are not at hand.

In the context of present-day planning, educational data have tremendous importance. Generally, this is because educational data show the status and development of education, i.e. they give a clear picture of the educational situation that is existing.

The importance of educational data can be summarized as follows. They: (a) give a concrete summary picture of the educational conditions at a given time; (b) show the relationship between different aspects of the educational situation, hence bringing to light any anomalous condition requiring special attention; (c) trace the lines of educational development in terms of changes which have taken place; (d) suggest probable directions and enrolment rates in the future; and (e) enable the measurement of plan- and policy-realization in precise terms.

With the above-mentioned functions, educational data can therefore serve as a foundation and framework for sound and effective educational planning, a source of information on the system and an indicator and a guide to policy decisions and action.

Educational planners are well aware that their quantitative estimates of enrolment, teaching staff and building needs and financial requirements are only the first step in planning education for economic and social development. They are equally aware that they must pay commensurate attention to the development of the structure of education and the provision of curricula that accord with broad social and political aspirations. This chapter, however, is concerned with suggesting a suitable statistical basis for the quantitative first step.

Types of data collection

Educational planning encompasses the provision of information necessary for framing and implementing appropriate policies in short-, medium- and long-term plans with regard to pupil enrolment in various levels and types of education and the adjustments of the outputs in accordance with the economic and social needs. It is also concerned with the orientation of flows of pupils into and within the educational system in accordance with, as far as possible, individual desires and the principles of equity and efficiency. Apart from enrolment data, it is also concerned with the main policy problems involved in creating a constant supply of teachers of various types and disciplines in sufficient numbers so as to ensure that pupils are adequately and properly instructed. To ensure that adequate school buildings and equipment are available and that they are used in an economical and efficient way is a major concern of the educational planner and therefore adequate data are important here as well. Finally, the educational planner is required to estimate the expenditure necessary to carry out the proposed programmes, to investigate possible sources of finance and to promote the efficient utilization of financial resources.

The costing of education is very important because as pupils move on to a higher level of education, the cost per pupil will increase. In addition to the trend towards more secondary enrolment, other factors will also tend to increase average costs. For example, the emphasis of science, technical and vocational education as against the humanities will tend to increase costs. Furthermore, it is envisaged that more residential places will be required in our secondary schools in order to improve the opportunities for rural pupils. Coupled with these, all our efforts to improve the quality of education, especially up-grading and/or up-dating teacher qualifications, will definitely increase the costs of education.

In order to diagnose educational problems and to provide sufficient and reliable information needed for orderly and efficient expansion and changes in the system, it is obvious that the first step is to survey the educational situation and needs. This can only be achieved if there is a well-organized statistical service.

It is uneconomical to collect statistics without a reasonably clear idea of the purposes for which they are to be used. It is necessary therefore to establish rather more precisely the questions to which the educational planner is trying to provide answers. Educational statistics should be gathered in such a way as to permit the integration of manpower, social and individual demand, and the cost and financial aspects of educational planning. Basically the data so required are of two types: statistics concerning the educational system itself, i. e. pupils, teachers, buildings, expenditure, etc. and the considerable supplementary data required by educational planners for the calculation of forecasting and planning coefficients within the educational system, including demographic, economic and social data.

SUGGESTED LIST OF TYPES OF DATA

Below is a suggested list of the types of data considered basic and essential for educational planning; it is by no means exhaustive:

Pupils in primary and secondary schools

Pupils by sex, race, private or assisted school, rural or urban school, medium of instruction, and stage of education. Number of classes by level and type of education. Average enrolment per class. Distance of pupils' homes from school. Mode of transport to school. Family income. Educational attainment of parent or guardian. Occupation of parent or guardian. Grade 3 and Grade 5 Assessment Examination results of pupils. LCE (grade 9), MCE (grade 11) and HSC (grade 13) examination results of pupils. Pupils attending classes in Islamic religious instruction or other religion classes in school. Pupils receiving scholarships (type and value of scholarships). Pupils receiving free textbooks. Pupils receiving other aids (e.g. school uniform, shoes, transport allowance, etc.). Pupils doing elective subjects (commerce, domestic science, industrial arts, agricultural science) at the lower secondary level. Pupils doing practical subjects (metalwork, woodwork, needlework, cookery, etc.) at the upper secondary level. Pupils according to arts, science, technical and vocational streams at the upper secondary level. Pupils according to arts and science streams at the post-secondary level. Pupils in vocational schools according to subject areas (electrical installation, radio and television servicing, machine shop, etc.). Pupils in technical schools according to subject areas (mechanical, building, survey, etc.). Pupils in special education (deaf, blind, spastic, etc.).

Teachers in primary and secondary schools

Teachers by sex, age, race; type of school, assisted or private school, rural or urban school, and medium of instruction of school. Marital status of teachers. Number of years of teaching experience. Academic qualification. Professional qualification. Number of unqualified teachers. Teacher qualification by subjects. Subjects taught by teacher in school. Attendance at in-service courses organized by the Ministry of Education (state type and duration). Attendance of other courses, locally or abroad. Language teachers. Islamic religious knowledge teachers. Number of volunteer teachers (Peace Corps Volunteers, Voluntary Service Overseas (VSO), etc.). Teachers according to salary scale. Number of teachers lost to the educational system for various reasons.

Particulars of school

Type of school building (wooden, concrete, etc.). Date of establishment. Single or double-session school. Rural or urban school. Area of school including compound. Size of school. Number of primary and secondary schools within a radius of five miles from a particular school. Number of classrooms for formal instruction. Canteen. Playing field. School hall. Special rooms (arts and crafts, music, workshop, science laboratory, etc.). Teaching aids (television, radio, projector, etc.). Dental/medical room. Feeding programmes (type and percentage of pupils involved and frequency). Parent-Teacher Association. Teachers' quarters. Types of co-curricular activities (football, *sepak takraw*, geographical society, science society, etc.).

Particulars of finance

Total salary of teachers per month. Total salary of non-teaching staff per month. Other recurrent costs. Subject grants (library, science, agricultural science, home science, etc.). Total private income of school (from donations, canteen, bookshop, etc.). Total expenditure of school (excluding salaries). Expenditure on maintenance (water, electricity, repairs, etc.). Expenditure in buying school furniture. Expenditure in buying school equipment. Fees collected from pupils (sports, examination, needlework, etc.). Development expenditure by level and type of education.

Institutions of higher learning

Student enrolment by year, level and field of study (science, engineering, humanities, economics and administration, etc.). Student enrolment by sex and race. Students awarded scholarships (type and amount). Student output by field of study. Staff enrolment by race, sex and status (assistant lecturer, senior lecturer, professor, etc.).

Students abroad

Number of students attending institutions of higher learning overseas, by sex and ethnic origin. Type of course and name of institution. Commencement and duration of course. Number of students awarded scholarships. Background of students (government officer as against private individual).

Demographic

Total population by sex, age, race and state or region. Population projections by single years, according to sex, race and state or region.

Description of the procedure of data collection

PRIOR TO 1977

Educational data are compiled by the Statistics Section of the Educational Planning and Research Division (EPRD), Ministry of Education. For universities and other institutions not directly attached to the Ministry of Education, EPRD requests data from them for publication in the annual report, but no specific forms are sent out for this purpose.

In so far as schools under the Ministry of Education are concerned, there is a two-tier system for the collection of data, namely at the state level and at the national level. The forms for data collection (proformae) are developed at EPRD in conjunction with the relevant divisions of the Ministry of Education and copies are sent to the state education offices for action. At the state education offices, these proformae are reproduced in sufficient numbers and then dispatched to schools and other institutions for procuring the statistics.

The proformae for schools are sent in duplicate by the respective state education office and sufficient time is allowed for the completion and return of one copy. At the State Education Office, the data collected are consolidated and summary tables are prepared to give overall state figures. For most of the proformae, EPRD allows the State Education Office six to seven weeks to get the proformae completed by the schools, to consolidate the information and to return the same. The data are then further consolidated at EPRD to reflect the national situation. All these steps involve hand tabulation and the process is rather slow and tedious.

In general, the data so collected through the use of proformae cover enrolment, school buildings, teachers, examination performances and educational costs. Most proformae are sent in once a year (mostly giving data as on 31 January); for some, data are required as on 31 January and 31 July. A few have other dates of reference so as to get the latest available data for the current year, e.g. enrolment in form VI is available after April and financial data after December.

Apart from the consolidation of data so collected at the state level, EPRD attempts to analyse the data and the results are made available to the relevant divisions of the Ministry of Education for information and necessary action. Examples of the analysis done by EPRD are: enrolment ratio; survival rate; average class enrolment; pupil/teacher ratio; percentage of trained/untrained teachers; percentage of graduate/college trained teachers; percentage of enrolment according to streams and levels of education; distribution of enrolment according to ethnic groups, etc.

FROM 1977 ONWARDS

Although the school is used as the unit base for data collection, the consolidated data reflect at most the state and national situation. Detailed information regarding individual schools is not easily retrievable. This is understandable as the process of consolidation is done by hand tabulation.

To increase the efficiency and comprehensiveness of the educational statistics so that educational planning can be carried out effectively, EPRD has launched the project of computerizing educational data collecting beginning in 1977. As a start, data pertaining only to enrolment and teachers are being computerized. When this initial step is successfully implemented and on a sound footing, EPRD will broaden the data base to include other educational statistics such as educational costs, school buildings and facilities, and those pertaining to socio-economic considerations. Hence for the time being, the collection of other data not included in the computerization project will continue simultaneously, but will be manually tabulated.

The task of computerizing educational data has been taken up by EPRD in collaboration with the Computer Unit of the Examinations Syndicate. Basically this project involves the revision of existing proformae pertaining to enrolment and teachers so as to make them suitable for computerization. Heads of schools are required to fill in the particulars on the new revised proformae and then transcribe by shading on to the OMR (Optical Mark Reader) forms. These completed OMR forms are processed by the Computer Unit and the data so obtained are stored on tapes. It is then possible to obtain detailed information and an analysis of data concerning any particular individual school.

It is very important that the data so collected are reliable and valid. Hence when the project was first initiated, certain precautionary steps were taken, beginning with a pilot project in one state only, prior to implementation at the national level. It is essential that officers at state education offices who are to act as co-ordinators of the project in their respective states and heads of schools who are to supply the required data fully understand the whole process of the project, including the terminologies contained in the proforma and the transcribing of data to the OMR forms. All these are dealt with at briefing meetings, first with officers from EPRD/Computer Unit and officers from state education offices and second, with officers from state education offices and heads of schools. The latter briefings are held on a regional/district level within each state.

It has been stressed that the educational data so collected should be reliable, valid and meaningful. Otherwise it would not be possible to reflect the situation as it exists in the educational system. Having collected the data, the next important step is to have it computerized and analysed. Finally, such information should be supplied to the officials who are to make policy decisions. Hence it is important to ensure a continuous flow of information in any administrative set-up. Otherwise the purpose of educational data will defeat its objective, thus contributing to the negative approach of data collection.

Establishment of educational resource centres

Another significant introduction to the system of education in Malaysia will be the establishment of the education resource centres within the Third Malaysia Plan period (1976–1980) in all the states of Malaysia. Initially four centres will be set up as a pilot project in four states. This is intended to enhance the flow of information, particularly in curricular and pedagogical matters, not only from the ministry downwards, but more importantly from the grass-roots level upwards to the ministry.

Each centre will have classrooms, seminar rooms and facilities for AVA workshops, darkrooms, library and residential facilities to accommodate forty teachers.

The building and the operation of the centres will represent a new precedent in Malaysian education. To operate as effective centres of change in the states in which they will be located and to serve the needs of rural teachers, the centres will need creatively planned programmes, including: (a) the provision of up-to-date information on educational innovation and development through the publication of a monthly bulletin; (b) the supply of relevant information to schools on teaching-aids, hardware and software, together with samples, their uses, prices, sources of supply; (c) the provision of reference materials such as books, textbooks, journals and charts and facilities for small-scale photocopy production of these materials; and (d) the holding of in-service courses, meetings, seminars and informal gatherings.

It is hoped that these activities will generate information exchange among teachers as well. Thus the flow would be horizontal as well as vertical.

Conclusion

Due to the knowledge explosion and increased expectations from education, it is now recognized that educational planning has to be extended right down to the grass-roots level. In order to achieve this, it is essential that there should be a mechanism to ensure the continuous flow of relevant information from the bottom to the top and vice versa. At the same time, the need to be responsive to public opinion in educational planning is also recognized. All those actively involved in implementing a plan should be brought in at its formulation stage. In the case of educational planning, such people would be representative of private agencies involved in education, such as teachers' unions and organizations, parent-teacher associations, etc.

It is very important that the nature of local participation be well understood by all concerned. It should be explained that public views are sought only in a consultative manner. This is to ensure that educational plans are responsive to public wants and needs. However, the final authority must remain with the central policy-making body.

The importance of information, be it at the gathering stage or dissemination stage, is unquestionable. However, it is unclear how successfully the relevant and reliable information reaches the authorities concerned, thereby ensuring that educational plans are based on wise decision-making and not on intuition. Hence it is very important that there should be a continuous evaluation of the organizational set-up guaranteeing the smooth flow of information and thus bridging the communication gap between all concerned.

10 Mexico

Carlos Muñoz Izquierdo

Introduction

During the last decades, Mexico has carried out several educational planning projects. During the first stage (1959)[1] this was restricted to primary education. In the second stage (1965)[2] an attempt was made to consider the various educational levels jointly. At the third stage (1971)[3] improvement of the quality of the formal educational system and its extension were the targets. Including out-of-school education, these efforts aimed, through formal education, at a series of structural changes considered necessary in the larger society. Finally, the present moment is witnessing an effort to implement a National Educational Plan[4] which seeks to evaluate past efforts in order to build an educational policy which will effectively contribute to the attainment of the objectives of the educational system.

In spite of this, lately there has been insistence on the fact that the educational research carried out in Mexico has not been used in an acceptable manner by the country's decision-makers. Even though it has often been recognized that this research has contributed towards the attainment of other objectives—such as preparing new consultants and executors of educational programmes—it is more or less accepted that the country lacks communication mechanisms between the researchers and the directors of educational policy. This has led to a series of proposals concerned with: (a) increasing researchers' interest in problems that worry policy-makers; (b) ensuring that ongoing studies carried out by the various research institutions in the country are increasingly programmed and co-ordinated jointly; and (c) increasing the frequency with which the results of research projects are taken into account when the different aspects of educational policy are being defined.

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1. See 'The Eleven-Year Plan' below, page 125.
2. See the *Final Report* of the Comisión Nacional para el Planteamiento Integral de la Educación (1968).
3. See 'The Educational Reform (1971–73)' below, page 126.
4. See 'The National Educational Plan (1977)' below, page 127.

It has been suggested that some kind of organism be created, at a national level and with a definite government participation, which would be responsible for the planning and the co-ordination of research throughout the country, that researchers become increasingly involved in decision-making organisms, and that decision-makers increasingly participate in the educational research processes.

It seems appropriate here to point out that the suggestions expressed above result from superficial perceptions of the relationships of the last few years between educational research projects and the decision-making processes in the country; these opinions do not give sufficient importance to the process of transferring new knowledge that has been gained in Mexico in the educational field during the last few years.

Certain constraints and disadvantages could derive from the acceptance of these suggestions. Therefore, an alternative model is proposed in this chapter to ensure that, in the future, educational research contributes to a greater degree to the improvement of policy adopted in this field.

Working hypothesis

If Mexico lacked adequate channels of communication between producers and consumers of educational research (or if the existing ones proved inadequate), there would be an evident gap between research carried out during a certain length of time and the innovations introduced in the country during the same period. In the same manner, an inventory of educational studies being carried out at a certain moment would demonstrate a disparity between the research subjects and the main problems worrying educational planners. In the following paragraphs, we analyse data to support or reject this hypothesis, from a historic as well as from a static point of view.

Relationships between educational research and educational development

HISTORICAL PERSPECTIVE

Typology of educational research

Recognizing the inevitable constraints that limit typology-building efforts, we nevertheless believe that it is possible to classify the most discussed and published literature on education during the past twenty-fivey ears in Mexico as follows:

1. Studies, research projects and philosophical essays that emphasize the need to use education as a vehicle for the transmission of certain values, attitudes and behaviours that, after a certain length of time, may favour the

development of social structures more in accordance with certain ethical and humanistic objectives.

2. Psycho-pedagogical studies and research projects which insist on the need to adapt educational processes to the particular characteristics of different types of students and regions in the country, as well as on the need to adopt didactic methods and curricula which favour personal growth and development.
3. Sociological, economic and anthropological studies and research projects which point out the relationships between education and the larger socio-economic context, and which emphasize the need for educational planning as part of general development planning, in order to counteract the influence of certain variables that do not permit education to function as a channel for social mobility, as a means towards the redistribution of income, or as a vehicle towards a greater participation in the country's political process.
4. Studies, research projects and essays in the field of political sociology and political economy. These studies insist on the need to transform significantly the country's economic development model—whether or not this implies the modification of the existing power structure—in order to ensure that the education received by certain social groups, which have up to now remained marginal in terms of the benefits of development, may become a means towards a better way of life for those groups.

This typology is based on various ways of viewing and interpreting the relationships between education and development. It is important to note that these views have not been introduced chronologically. On the contrary, they have been published and discussed, at certain moments, simultaneously. On occasions, some have been considered complementary. The important fact is that they have been gradually taken into account by educational planners during the last eighteen years.

Educational policy

The Eleven-Year Plan (*Plan de Once Años*). During President López Matsos's administration (1958-1964), the National Plan for the Improvement and Extension of Primary Education was worked out. In order to achieve the ends of this plan, curricula were revised and the necessary financing was provided to accelerate teacher training and enrolment growth at this level. Some of the plan's principal characteristics are described below.

First of all, the plan sustains, implicitly, the principle that the Ministry of Education's duty, in terms of the Constitutional precept of compulsory primary education, is accomplished the moment schools have the capacity to enrol all those members of the school-age population with the psychological social, economic and demographic characteristics permitting normal school attendance.[1] Therefore, in establishing its quantitative goals, the plan took into account only what is known as 'real demand', which is, obviously, much lower than the number of primary school-age children. In other words, it did not consider that the exogenous factors limiting educational demand had to be counteracted by means of explicitly designed educational programmes. It also did not consider it necessary to offer alternative modes of education to those who, having the right to attend school, could not do so.

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[1] Secretaría de Industria y Comercio, *Fundamentación Estadística del Plan de Once Años*, Mexico City, 1960.

Further, the plan's underlying pilosophy emphasizes the need for education to facilitate the child's adaptation to his cultural, social and economic milieu. This socio-economic approach assumes an immediate acceleration of economic and social development, as a result of a rapid growth of educational development.[1] The curriculum which was introduced in primary schools reflects the influence of 'progressive' and 'liberal' pedagogical schools. In fact, the main preoccupations noted both in the educational objectives and in the didactic methods introduced in elementary education during the plan years are around the need of 'favouring the harmonious development of the student'. This development must be the result of the 'constant interaction of the student with his milieu', and the process leading towards it must be 'gradual and continuous', in such a way that one stage will naturally lead to the next. In short, the objective was to 'facilitate the adaptation of the student to the norms imposed by life in society'.[2]

One of the immediate consequences of the plan was the accelerated growth of primary education, concentrated mainly in urban areas. This expansion, in turn, increased the demand for secondary education (1964–70) and for higher education (1970–76). These educational levels grew rapidly.

However, and perhaps as a consequence of the demonstrated inability of the economic system to absorb the growing number of graduates and drop-outs from the school system, various social pressures were generated. These, in their turn, created opportunities for new attempts at introducing changes in educational policy in 1971 as well as in 1977. These changes were based on varied views and analyses which became known during this period.

The Educational Reform (1971–73).[3] Among the efforts carried out from 1970 to 1976 with the objective of 'accelerating the revolution'—which, as was often recognized, had remained stagnant since the 1940s—were the measures taken to reform the educational system. These measures are summarized in the new Federal Law of Education, which includes the following:

1. The acceptance of an educational philosophy that assigns to education the role of an agent of social change. This is why the law stipulates the need for education to promote the social conditions that will lead to a more equal

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[1] Manuel Bravo Jiménez, 'El Desarrollo Económico y el Progreso Educativo', in *Educación en el Trabajo y para el Trabajo*, 1963, p. 38 et seq. (Reforma Educativa, 9).

[2] Consejo Nacional Técnico de la Educación, 'Principios en que se Funda el Sisgema Educativo National', in *Objectivos y Requisitos de los Planes de Estudio*, 1962 (Reforma Educativa, 2).

[3] See *Ley Federal de Educación*, 29 November 1973.

distribution of both material and cultural goods and to develop attitudes accordance in with a more just social life.

2. The introduction of educational content to develop the capacity for observation, analysis, interrelation and deduction, and critical thought.
3. The adoption of educational methods that develop the capacity of students to learn of their own accord and that favour group work, in order to ensure a communication and dialogue among students, teachers and parents.
4. The implantation of varied systems of formal out-of-school education (especially through open-learning systems) in all the educational levels, as well as the establishment of accreditation systems for education obtained outside the regular school system.

As may be noted, these measures implied the adoption of completely different criteria from those that had inspired both the curricular changes and the quantitative planning in 1959. This was made possible by the communication established between those who had the necessary knowledge to introduce changes in educational policy and the decision-makers—at the various levels—who officially accepted them. This communication took place in several committees set up by educational authorities in 1971 as part of a plan to consult public opinion, educational technicians and the different levels of educational bureaucracy. Between 1966 and 1968 an educational planning effort was carried out. The plan proposed the introduction of several important changes in the educational system. However, according to Benveniste,[1] the plan—in spite of having been worked out by a group of technicians chosen by the Ministry of Education—was never officially accepted; it was rejected by the intermediate bureaucratic levels, which were not asked to participate in the planning process.

Some of the main practical consequences of the reforms introduced beween 1971 and 1973 were: the renewal of textbooks and curriculum for primary and secondary education; the establishment of several open-learning systems and accreditation mechanisms for studies outside the conventional school system; and the introduction of new modalities of secondary education that serve the purpose both of preparing students for higher education and of training them for the labour market at the sub-professional level.

The National Educational Plan (1977).[2] Among the main activities carried out by the presidential administration inaugurated on 1 December 1976 are the steps taken towards the formulation of a new National Educational Plan. This intends to guarantee coherence both between ends and achievements of the educational system, and between educational policy and other branches of policy which affect the economic and social development of the country. Although all the necessary steps to translate the plan's objectives into quantitative goals, to establish effective priorities and to design the specific measures for its implementation have not yet been taken, the tasks carried out to date indicate that its main characteristics will be as follows:

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[1] Guy Benveniste, *Bureaucracy and National Planning*, New York, Praeger, 1966.

[2] See Secretaría de Educación Pública, *Plan Nacional de Educación*, Vols. I–VII, Mexico City 1977.

1. The adoption of systems analysis (as an instrument for the study of the interrelations between the educational subsystem and other social subsystems) to determine the way in which educational policy must be complemented with other political decisions affecting economic and social development. The object is to improve the degree to which the educational system fulfils the roles assigned to it.
2. The establishment of various systems to co-ordinate the supply of out-of-school education offered to marginal populations with other measures which contribute both to improve the effective demand of this type of education and to increase its external efficiency.
3. The accelerated growth of pre-school education in order to improve the academic achievement in primary school of children who come from lower social strata and who will reach primary school age in the near future.
4. The establishment of support for teachers who work in schools attended mainly by children from the lower social strata.

These characteristics allow us to anticipate that educational policies established in the future will take into account, one way or another, the discoveries and views of educational researchers of the last few years. This means that the existing channels of communication among researchers, politicians and teachers have not been entirely useless.

STATIC PERSPECTIVE

A second way of submitting our working hypothesis to proof from empirical data consists, as we have already mentioned, in examining the relationships between the subjects of the research projects being carried out at a given moment and those educational problems being considered, in the same period of time, by decision-makers. In order to do this, we have used Vielle's analysis[1] of the Inventory of Institutions and Projects of Educational Research carried out by the National Council for Science and Technology (CONACYT) in 1975.[2]

After classifying the research projects included in the inventory in several different manners, Vielle found that two-thirds of these are oriented towards decision-making. These projects are concerned with the different aspects related to the diagnosis and evaluation of the educational system; with the rationalization of the administrative structure of the system; with the renewal of the school system through the development of technical mechanisms; with the development of parallel systems which complement conventional education; and with the technical implementation of the said systems. Only 35 per cent of these projects are centred on traditional aspects of educational research. If we consider that this inventory was carried out at the time when the educational reform of 1971–1973 was being put in practice, we necessarily conclude that the channels of communication between researchers and educational planners have functioned with sufficient efficiency.

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[1] Jean Pierre Vielle, 'La Investigación Educativa en México: Su Contribución al Estudio y Desarrollo de la Educación', *Revista del Centro de Estudios Educativos*, Vol. VI, No. 3, 1976.

[2] See: Secretaría de Educación Pública, *Las Instituciones Mexicanas de Investigación Educativa, 1973–1974*, Mexico City, SEP, 1975.

Ignorance of the research projects or different points of view on the criteria for their use?

In any analysis of the way in which educational research has been used in the country, many researchers, including ourselves, would undoubtedly include a series of proposals, recommendations and experimental developments that, from our point of view, have not been taken satisfactorily into account. This point constitutes the main support of certain specific attitudes of some authors who have questioned the utility of educational research in Mexico. It is obviously not possible to present a complete catalogue of these proposals. Nevertheless, we will mention a few examples that may lead to interesting considerations.

First, it has been demonstrated that the patterns currently adopted in distributing educational resources produce regressive effects and contribute to devaluating the schooling received by social groups who have only recently begun to attend primary education. Therefore, the need to change the trends of educational financing has been insisted on. However, there has been a weak response on the part of decision-makers to these suggestions and modifications have only been applied in some recently established official institutions of secondary importance that offer secondary and higher education, and not in those institutions in which the majority of students at this level are concentrated.

Second, several critical analyses of the country's development model and its relationships with the behaviour of the school system have been carried out, and a considerable number of suggestions for the transformation of this model have been published. Response here has also been insufficient, for only a few measures for the protection of the so-called informal sector of the economy have been designed.

Third, the need to establish preventive, compensatory and remedial educational systems has been often insisted on. The response to these recommendations has been limited to improving pre-school education for the children of working mothers and to establishing formal out-of-school education for adults.

The fact that the few measures mentioned above have been introduced in economic and educational policy indicates that the studies on which these recommendations and proposals were based have reached educational decision-makers. However, they have fallen outside of the viability horizon determined by the political conditions surrounding decision-makers. An explanatory hypothesis is that, at least in the examples mentioned above, which are all related to important aspects of educational policy, the relative inapplicability of research is not caused by lack of communication between producers and consumers of research, but rather by the contradictions which, on a short-term basis, exist between the frames of reference of researchers and those of decision-makers.

Based on the Mexican experience, it may be said that the principal mechanisms through which educational innovations have been introduced have been meetings and conferences of different types (i.e. for university deans, primary schoolteachers, etc.), and the ad hoc committees established by the government, after taking the decision to revise definite aspects of the country's educational policy. An interesting study on this subject carried out by I. Alvarez[1] reaches the conclusion that, in Mexico, the procedure for the adoption of innovations is quite distant from Havelock's linkage model[2] which assumes that the points of view of those who suggest innovations and those who officially introduce them are complementary. Instead, it approaches what seems to be a 'dialectical model' that supposes, on the contrary, that a struggle exists between the political power of those who accept innovations and the technical power of those who propose them. This evidence supplies additional support, at a specific level, for our interpretation of the difference existing at an aggregate level between the conclusions of some studies and the decisions that have stemmed from them.

Directed research and its possible consequences

Underlying the considerations made above are two facts of fundamental importance. The first is that the problems that have been studied or discussed among researchers have in every case gone beyond the limits established by those in charge of designing educational policy. Only because of this, when political conditions permitted, have the innovations introduced in the country been possible. The result has been, as we have seen, a gradual modernization of concepts, instruments and effects of educational planning.

The second fact is that, once the government has decided to accept a certain innovation (for example, open-learning systems), it has provided the technical, organizational and financial capacity needed for experimental models, testing them and finally generalizing the innovation. This indicates, on the one hand, that the scientific community has been capable of providing the human resources needed for the development of these processes; and, on the other, as the 1975 inventory demonstrates, that research institutions actively participated in these developments.

This leads us to support the continuation of educational research following the course dictated by its own dynamics; in this way, the results of the different projects are validated and researchers will continue to have a broad horizon from which to select their field of inquiry. This is absolutely necessary if research is to broaden the scope of options open to decision-makers. Therefore any attempt at co-ordinating educational researchers (whether by a government institution or any other organism) should take them into account.

A similar consideration may be made in relation to transfer of researchers from research institutions to decision-making centres, where they may

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1. Isaias Alvarez, 'La Difusión de las Ideas y el Cambio en la Formación de Maestros de Primaria en México: un Caso Historico Exploratorio', *Revista dal Centro de Estudios Educativos*, Vol. V, No. 3, 1975.
2. Ronald Havelock, *Training Change Agents*, Ann Arbor, Mich., Litho Crafert, Inc. 1973.

intervene (not merely as consultants, but directly) in the implementation of educational programmes. Once more, it is necessary to recall that the data presented here clearly indicate that innovations are accepted and generalized only when political conditions permit. Therefore, the assumption that the transfer may function as an independent variable in the process of innovation is doubtful; it might even retard the maturing and developing processes of research institutions.

How may the effectiveness of educational research be improved?

What we have said up to now may be summarized as follows:

1. The relative autonomy that has up to now characterized research institutions has permitted them to prepare the development of new ways of conceiving educational problems, the diffusion of their global approach and the introduction of more and more original solutions.
2. The responses provoked by research in educational policy have not been as strong as the members of the scientific community would have wished.
3. Some of the dangers of any attempt at improving the utility of research through a more organic relationship between producers and potential consumers have been pointed out. Existing mechanisms have permitted an adequate communication of research results to decision-makers.
4. Finally, we posed an explanatory hypothesis that the use of research results in education does not depend so much on their being known to decision-makers, nor on the researchers becoming educational politicians, as on the existence, at a certain moment, of objective conditions of a political nature that demand the use of these results.

Which, then, might be the route allowing educational politicians to respond more effectively to the challenges posed by educational studies, so that both the process of educational modernization and that of policy actualization may be accelerated? In other words, what procedure might permit the creation of the political conditions that might, at the right moment, make the inclusion of research results in the process of decision-making necessary? The creation of these conditions obviously depends on the type of demands received by the political system; on the manner in which these demands are articulated and on the support which the creators of the demand may offer the system. Therefore, the use of research results will increasingly become a direct function of the degree to which the public, and, more specifically, the groups who could potentially benefit from their use, are aware of this type of research. Hence the importance of reinforcing the channels that contribute to the distribution of research results, thereby eventually provoking discussion, awareness and analysis which, sooner or later, could establish favourable conditions for the use of the research results in question. Meanwhile, even the most efficient linkage between researchers and policy-makers cannot avoid the risk that certain research results will never be taken into account.

11 Papua New Guinea

Keith Hinchliffe

Introduction

Papua New Guinea obtained self-government from Australia at the end of 1973 and achieved full political independence in September 1975. Perceptions of the 'development process' at the time were very different from those ruling fifteen years previously when the bulk of colonized countries became independent. Earlier emphasis on industrialization, urbanization, comprehensive planning, income creation, administrative centralization and human capital formation was, by the early 1970s, giving way to a greater consideration of rural development, the informal sector, income distribution, administrative decentralization and a general scepticism of the value of comprehensive planning. As a result, the questions being asked of educational planners in Papua New Guinea today can be expected to differ in many respects from those asked in the then newly independent countries in the early 1960s.

As will be explained more fully later in this chapter,[1] the evolution of a new administrative and political structure resulting from the introduction of decentralization in 1978 will have significant implications for the types of information required for educational planning and the directions in which that information is channelled. Education is the major function, in terms of resources, to be transferred to provincial governments and administrations. It has been recognized at the national government level that the setting of national priorities and movement toward these require a more detailed and formalized information system. The next step is to persuade provincial governments to co-operate in the collection of this information by convincing them that it is useful for their own planning purposes.

This chapter begins with a short description of the economic, financial and budgetary context within which Papua New Guinea's educational system operates. The development of the system, its present structure and the organization

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1. This chapter draws on the author's experience as United Nations Development Programme (UNDP) Economic Adviser to Papua New Guinea from 1975 to 1977.

of decision-making up until 1978 are then described. In the following section, many of the perceived educational problems are presented together with examination of the types of information required to aid the formulation of answers. Finally, the effects on these requirements of introducing a system of provincial government are discussed.

The socio-economic setting

The 2.9 million population of Papua New Guinea is spread over 480,000 km^2 and densities vary by province from 0.8 to 5.7 persons per km^2. According to the last census, in 1971, only 11 per cent of the population lived in urban centres; the rest was spread over 12,000 villages. Of the nineteen provinces, only the five highland ones are connected by road. Understandably, the provision of government services in the context of poor communication and wide dispersal of population is both expensive and often ineffective. In 1971, the adult literacy rate in Pidgin, English or Motu was 30 per cent while only 11 per cent of the labour force had completed primary education. Of the 2,500 persons in the professional manpower category, only 4 per cent were Papua New Guinean.

Per capita income levels of the local population are around US$350 and changes are strongly influenced by variations in the export prices of copper, coffee, cocoa and copra. During the period 1970–73, real GDP increased by 8 per cent a year, but since then there has been virtually no overall growth in the economy. Between 1968 and 1975, government revenues expanded at an annual rate of 13.5 per cent but since then expansion has been slight. In the period 1978–81, revenues are planned to expand annually by 3 per cent, but even this will involve increased borrowing. Education's share of total government expenditure has been fairly constant at between 16 and 17 per cent in the recent past but shares have radically changed between levels. The share of primary schooling fell from 46 per cent in 1966 to 36 per cent in 1977, while the post-secondary share increased from 8 to 29 per cent.

Any consideration of policy-making in Papua New Guinea since self-government should recognize the 'state of the art' prior to that time. Few major decisions were taken in the country itself and in those which were, the involvement of Papua New Guineans was minimal. One of the first tasks of the new government was to erect a policy-making framework for national budgeting. The most important feature of the framework for the purposes of this paper was the creation in 1975 of a departmental priority schedule. Six categories of government activities were chosen and the following priority ratings assigned: economic opportunities, 23; modern sector, trade and industry, 21; infrastructure, 19; social, cultural and environmental, 12; law, order and defence, 12; policy and administration, 4.

These ratings have been used as a guideline for allocating marginal increases and decreases in government expenditure. Education falls, naturally, into the fourth category and is not therefore given a high priority in terms of the allocation of additional resources. (It is however the largest-spending department.)

The introduction of an annually rolling public expenditure plan in 1978 is unlikely to alter these overall priorities.

Summing up this section, in view of the expected slow growth in government revenues and the low priority given to educational expansion, any problems and pressures relating to the educational system cannot expect to be met by increased financial resources in the immediate future.

Development and structure of education

In 1971, well over a quarter of all public-sector jobs were held by expatriates. By 1976 this proportion had fallen to 13 per cent and, in spite of an overall increase in employment of 115 per cent, the expatriate total had substantially fallen. This illustrates two points: first, the neglect of post-primary schooling up to the early 1960s; and second, the rapid increases since then.

Table 11.1, based on a variety of Department of Education published and unpublished documents, shows the growth of enrolments between 1960 and 1975.

TABLE 11.1. Enrolments by educational level, 1960–75

	Enrolments (thousands)				Average annual growth rate (%)			Enrolment ratio (%)
	1960	1965	1970	1975	1960–65	1965–70	1970–75	1975
Primary	89	182	208	238	15.5	2.72	2.72	56.8
Secondary	3.3	9.4	22.4	38.4	23.3	18.8	11.5	16.3
Post-secondary	0.2	1.0	1.9	3.6	32.0	13.8	13.0	3.4
Higher	—	—	0.9	2.4	—	—	21.0	0.9

Primary schooling is a six-year cycle and entry is officially at the age of 7. Since 1965, expansion has not kept pace with the birth rate owing to a minimal growth of female enrolments. The 1976–80 education plan called for grade 1 enrolments to be expanded from 68 per cent of 7-year-olds in 1975 to 92 per cent in 1985.[1] A recent planning exercise has revised this target to 85 per cent.

Secondary level schooling enrolments consist mainly of 30,000 high school and 5,400 rural vocational centre students. The recent annual growth rate of high school enrolments has averaged over 11 per cent as a consequence of strong social demand. This results from a large measure of existing provincial inequality and a tightening of the labour market for primary school leavers. High schools consist of two two-year stages and around 60 per cent of entrants complete the full cycle. Entry is based on a quota system whereby places available

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1. Department of Education, *Education Plan 1976–1980*, p. 26, Port Moresby, Government Printer, 1976.

within a province are distributed among primary schools on the basis of their enrolments. Selection is by examination and teacher assessment, and around one-third of primary school leavers enter high schools. The education plan proposed thirty-four new high schools before 1980 leading to a 30 per cent increase in first year enrolments. While recognizing that such increases were not justified on manpower grounds, the expansion was proposed on the arguments of provincial inequality and maintenance of educational opportunities for primary school leavers. Rural vocational centres offer one- or two-year courses, the contents of which are decided locally.

Post-secondary schooling includes both primary and secondary teacher training colleges, national high schools and technical colleges. Seven of the nine primary teacher training colleges are run by church agencies and by 1978 it was expected that nearly all entrants would have completed four years of secondary school. A single teachers' college exists for training secondary school teachers and this is to be substantially expanded in an effort to reduce the heavy reliance on expatriate teachers in these schools. Two national high schools offer a two-year pre-university course and two more are planned. Finally, there are nine technical colleges offering a wide range of apprenticeship and block-release courses. The future of these colleges is expected to be reapparised in the near future as advocated in the education plan.

The higher education sector comprises two universities, one concentrating on arts and social science subjects and the other on technology. Enrolments are in the ratio of 2 to 1 respectively.

TABLE 11.2. Average budgetary cost per student year, 1976 (in US$)

Level	Cost	Level	Cost
University			
Technology	7,336	National high school	1,256
Arts and social science	5,005	High school	382
Technical college	1,426	Vocational centre	359
Teachers' college	1,417	Primary	116

Source: National Planning Office, *Manpower Trends—2*, p. 47, 1977.

The costs shown in Table 11.2, which are well above those in most countries at a comparable level of economic development, partly reflect the high salaries paid to expatriates; they also result from relatively high salaries for local teachers and an inflated wage structure in general.

Within a highly centralized government administration, decision-making within the education sector has been perhaps the most decentralized. Basic to the process has been the establishment of the National Education Board in 1970 and provincial education boards in the following year. The National Education Board, which is an advisory body reporting directly to the Minister of Education, owes its existence largely to the important educational role played by the missions (as providers of over half the primary school places) and the necessity of providing them with a voice at government, level. This body has a membership representative of government churches, local councils, teachers and civic interests and is responsible for the general supervision of the education system including planning the number and location of schools, the requirements of teacher education, the distribution of provincial staff quotas and the establishment of national rules for the selection of students. At the local level, provincial education boards appoint teachers within the province, determine the location of new primary schools and approve enrolments within the limits prescribed by the National Education Board. The success of these provincial bodies, at least in the view of the Department of Education, is demonstrated by the following statement made by the Director of Education in 1972:

> One especially noteworthy feature of the year has been the degree to which provincial education boards have developed as the focus of education in each province . . . community participation is high . . . educational decision-making is responsive to local feelings.[1]

Six years later, these national and provincial boards are still operating and the latter are regarded as having been a useful stepping-stone to provincial governement.

Educational problems and information needs

Problems of education in all countries are multifarious and solutions depend on a number of inputs of which information is only one. Often the resolution of educational issues necessitates an increase in political nerve rather than more information and a call for the latter can be an important device for governments who wish to delay taking decisions and actions. In other cases, however, information is genuinely lacking. Papua New Guinea faces a number of educational issues and, as in other countries, their solution will depend on both political nerve and increased information.

PRIMARY SCHOOLING

Spatial inequality. The major perceived problem of education today is that enrolments vary widely between provinces. At the primary school level, grade 1 enrolments as a proportion of 7-year-olds ranged, in 1975, between 43 and 133 per cent across provinces. The Department of Education is fully committed to increasing enrolments in the relatively backward provinces and the continuing inequalities are mainly a reflection of geographical differentials in social demand. Provincial inequalities have been decreasing, however, as can be seen from the

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1. B. H. Louisson, *Education Old and New*, p. 139, University of Papua New Guinea, 1974.

improvement in the Gini coefficient of educational inequality from 0.26 in 1970 to 0.15 in 1975.

Sexual inequality. The main cause of variations in enrolments between provinces is the variation in female enrolments. For the country as a whole, in 1975, 69 and 44 per cent of the respective male and female age groups were enrolled in primary schools. In many provinces, the male enrolment rate is almost 100 per cent while female enrolments have stabilized at around 50 per cent. Girls are particularly under-represented in the five highlands provinces where enrolment ratios of 7-12-year-olds range from 15 to 28 per cent whereas for males the ratios vary between 51 and 78 per cent. The causes of this under-representation are partly specific to highlands culture but experience of efforts to increase female participation in other countries could be useful.

Low population densities. A second cause of low enrolment ratios in some provinces, or parts of provinces, is low population densities. For a whole province, the lowest population density is 0.8 per km^2 but within provinces some areas have much lower densities. The result is a combination of long walking distances to school, small classes which may only be held every two years, difficulty of recruiting teachers and in general a high level of logistical and financial obstacles. Again, experience of mitigating these problems in other low population density areas could be useful.

School location decisions. All statistical information in the hands of the Department of Education is disaggregated only to the level of provinces, which on average contain 150,000 people. Even within a province, members of the Provincial Education Board are unlikely to possess data on population distribution and existing schooling facilities throughout the province. Only two provinces have this information in the form of a distribution map even though many provincial decision-makers are illiterate. Detailed information on population distributions and travelling times to school is essential for realistic educational planning, particularly in areas where the government is attempting to stimulate enrolments.

Autonomous school building. In some parts of the country, particularly those which have been neglected due to difficult terrain, schools are established on the initiative of the local community without even the prior agreement of the Provincial Education Board. The demand is then made for teachers, and the mixture of political considerations plus the wish not to discourage examples of self-help encourage the department to be forthcoming. The result however is a decline in its ability to engage in accurate forward planning. Experiences in East Africa of dealing with similar situations but on a larger scale do not seem to be very useful.

Methods of selection to secondary schools. At present, approximately one-third of primary school leavers enter secondary schools and the main strategy in the education plan for secondary expansion is to increase provincial equality whilst maintaining the transition proportions in the relatively advanced provinces. This proposal was made despite the knowledge that manpower demands will in no way match supply. Irrespective of either the maintenance or reduction in the transition proportions, a continuing search needs to be made for the construction of a method of selection which does not result in a primary school curriculum geared to that minority who do enter secondary school. This is a common problem where international experience may help.

Language of instruction. Papua New Guinea has over 700 separate languages and three major ones—Pidgin, English and Motu. The 'language question' can only be answered within the country and the experiences of other countries grappling with this issue do not provide much help.

SECONDARY SCHOOLING

Spatial inequality. As with primary schooling, provincial inequalities in the provision of secondary school places is a major problem. In 1976, the proportion of children aged between 13 and 17 years in secondary schools varied between 5 and 23 per cent across provinces.

Sexual inequality. Less than one-third of secondary school places were filled by girls in 1975, and in six provinces the proportion was under one-fifth. While the proportion has been slowly rising in the last decade, it is surprising that the education plan has only aggregate targets.

Expatriate staff turnover. Two-thirds of secondary school teachers are expatriate and a majority of these are serving two-year contracts. Annual turnover exceeds 20 per cent, resulting in a discontinuity in teaching and a problem of forecasting teacher supplies over the medium term. Until the teaching force is totally localized, these will remain problems.

Employment opportunities. Secondary school entrants in 1975 numbered over 10,000 and were planned to exceed 13,000 in 1980. Manpower forecasts made by the National Planning Office in 1975, and now regarded as over-optimistic, suggest an annual demand in 1984 of 4,500.[1] Since the number of university graduates is also likely to exceed demand, secondary school leavers can expect to be restricted from even some of these jobs. The rapid growth of secondary schooling in the 1960s resulted in an over-expanded structure once localization had largely been achieved. High expectations remain, however, and political pressure for secondary expansion is, if anything, growing. It is on this issue that Papua New Guinea most needs help from countries which faced this problem earlier. Unfortunately few solutions appear to have been found.

TEACHER TRAINING

Selection system. One reason for low primary enrolments in the highlands provinces is that there are few highlands women who are teachers. This fact has been realized and an effort is now being made to increase recruitment from this group.

Expatriate staff turnover. Over 80 per cent of teacher traines are expatriate, which again results in a high rate of attrition.

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1. National Planning Office, *Manpower Trends*—2, p. 39, 1977.

HIGHER EDUCATION

Financing. The cost of university education in Papua New Guinea is prohibitive and mainly results from high salary levels, 250 per cent above those in British universities. Since the government started imposing marginal economies in 1976, the universities have witnessed extensive internal discussions relating to cost-cutting. A reduction in staff/student ratios, which are at present under 1 : 10, in the short run and localization in the long run appear to be the only viable policies unless the nature of university studies is radically changed. A greater flow of information from other post-colonial countries may be useful in this context.

ADULT EDUCATION

Non-co-ordination. Various agencies of the government are involved in forms of adult education and training. At the most formal level, each province has an adult education officer from the Department of Education. In addition, the departments of primary industry, public health and provincial affairs, plus the Office of Business Development carry out activities which are in the best sense educational. Under the centralized administrative system of departmental reporting, these activities at the provincial level have been poorly integrated. A pilot programme in the Southern Highlands province is expected to provide new information regarding the optimum level and structure of co-operation. In addition, the replacement of national government departments in the provinces by the newly created provincial governments is expected to produce better results.

The impact of provincial government

During 1978 and 1979, a wide range of national government activities were transferred to provincial authorities. At least in financial terms, educational activities were the most important. While the national department retained control over all curricula, teacher postings, examinations and certification, control over establishment, enrolments and administration lie with the province for all primary and secondary high schools and vocational centres. One main reason for retaining control over teacher supply is to attempt to limit the growth of secondary schooling in the advanced provinces relative to the growth in the backward provinces. Exercise of this control is likely to be the main contentious issue in the future.

One of the most significant developments in those few provinces which operated a provincial government in 1977 was their realization that without an adequate data base, which included accurate knowledge of the location of the population and existing physical resources, planning can only be inadequate. At the same time, the national government is aware that unless it receives high-quality information concerning provincial activities, its attempts to set targets and monitor their state of attainment will be frustrated. During 1978 it hoped to develop a provincial data system in each province.[1] This system would have three components: a planning directory which provides information on population and basic services distribution within each census division or local government area; a provincial mapping programme which translates the information in the directory to maps; and a provincial data library. Information would be collected annually. Such a system has already been operating in two provinces for two years and is regarded as having been successful in improving decision-making both by public servants and politicians, particularly in discussions involving the location of new social services.

Not all the problems associated with education can, however, be reduced so easily. In particular, there is the issue of further secondary school expansion. Social demand for this level of schooling is increasing in all areas of the country, while all manpower forecasts and the actual experience of the employment market in the last two years suggest that further expansion is not justified. While a policy of stabilizing enrolment ratios in the advanced provinces may be successful, the demands for expansion in the backward provinces will be very difficult to resist. A consequence of provincial government is likely to be an increase in the desire to employ only natives of the province and while this could ease the 'school leaver problem' in the backward provinces which rely at present on people from outside, the effect on the educationally advanced provinces could be severe. This in itself may lead to a reduced demand for secondary schooling but only if opportunities for self-employment are generated. If they are not, then the result may be an increase in demands for tertiary level education. To the extent that a system of provincial government will bring the public and the policy-makers nearer, information relating to this and other issues should be more easily communicated.

Conclusion

Most of the educational problems which exist in Papua New Guinea can be roughly grouped according to the type of effort needed for their solution. In the first category are issues such as school location, language policy, expatriate staff turnover and demand and supply disequilibria in the labour markets. These can be solved only through the generation of information specific to Papua New Guinea. Second-category issues include sexual inequalities in enrolments, the provision of social services in areas with low population densities, unplanned school building activity by local communities, methods of selection, the financing of higher education and the development and co-ordination of agencies supplying adult education. All these, and others, are common to a large number of countries and it would be useful for Papua New Guinea's planners to have access to research findings and experience gained from attention given to these issues in other countries, while simultaneously confronting them in their own country. In the third category are major issues such as provincial inequalities in the provision of schooling and the future aggregate level of enrolment expansion, particularly at post-primary level. Data on inequalities exist and manpower forecasts that are as accurate as they are likely to be for some time have already been made. This is the category of issues whose resolve is now awaiting political decision.

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[1] National Planning Office, *The National Public Expenditure Plan, 1978 to 1981*, Port Moresby, Government Printer, 1978.

Progress in the first category of issues will probably increase with the development of provincial government and the consequent demand for more detailed data collection. Issues in the second category will be aided to the extent that useful findings and experience are generated in other countries, the efficiency with which these are communicated and the degree to which they are responded to within Papua New Guinea. Interest in the experience of other countries is at present very small due to a mixture of little knowledge and a feeling, among many of the élite, that Papua New Guinea is capable of developing a unique 'Melanesian way' to problem-solving. Up to now, this approach has led to a series of compromises in many policy areas and continuation along these lines will not result in decisive decisions being made to those third-category issues which mainly require political resolve.

12 Thailand

Vichai Tunsiri

The decision-making process in the Thai education system is difficult to explain. Indeed, it is doubtful if there is one unified decision-making process or structure, since responsibility for each different level of education is invested in a different ministry. The information system which should be part and parcel of the decision-making process is extremely complicated. Attempts, however, will be made to describe the system and process of information flows within the Ministry of Education and to focus on two case-studies of educational development which involve the whole educational system. First, however, an overall description of the Thai educational administrative system will be made.

The Thai educational administrative system

The Thai educational administrative system is possibly one of the most complex in existence. Responsibility for the administration of education is divided amongst four government ministries, namely the office of the Prime Minister, the State University Bureau, the Ministry of Interior and the Ministry of Education. The last is responsible for secondary education, and the pedagogic aspects of the whole system except at the higher level. The Ministry of Interior is responsible for administrative aspects of elementary education. The State University Bureau is a co-ordinating body for all universities. The National Education Commission, under the office of the Prime Minister, is responsible for designing the national education scheme and the educational development plan. Thus, no single ministry is responsible for the entire system, The Ministry of Education is sometimes scathingly called the Ministry of Secondary Education. Thus, any change, let alone a reform of the education system, is always a difficult task, requiring a compromise of ideas, principles and interests of the four decision-making systems concerned.

For analytical purposes, information flow may be classified as internal and external. Internal information originates; in the system external information originates outside. Each of these may again be subdivided in terms of carriers, whether professionals, experts, or laymen, and of agencies sending messages: associations, the press, Members of Parliament, etc.

The internal information flow may be viewed as upward or downward. At the school, district and provincial level, the downward flow of information is the most crucial for the decision-making process. Schools, by and large, are attentive to rules and regulations from the centre. Even in matters concerning pedagogic standards, schoolteachers are very uncomfortable if not centrally directed.

Channels for the downward flow of information are either directed through the education officers, from the *changwad* level to the district level and on to the school, or, sometimes, directed through to the school principals, bypassing the *changwad* officers, much to their annoyance.

With reference to the upward flow of information, whether it exerts a great impact or not is debatable, but increasing demands for this flow are indicated by the growing number of reports requested by the departments.

Statistical reports are not the only form taken by the upward flow of information. School supervisors also send up their reports to their departments. Moreover, the inspectors from the office of the Under-Secretary of State, in their round of visits to the provinces, will report to the ministry.

Another channel for information flow within the system is the exchange process at meetings and seminars. Workshops are frequently organized for regional and *changwad* education officers, supervisors and school principals.

External information originates in the press and other mass media, and institutions such as legislative bodies, ideological or interest groups, the Family Planning Association, the Protection of the Environment group, etc. During three years of democratic government in the country (14 October 1973–6 October 1976), public opinion through the press and mass media was an influential factor in the decision-making processes and structures. For instance, it was long realized by the ministry that private school fees should be raised to help improving the standard of private schools. But it was also understood that opinion in the press would be against such policy. Consequently, the ministry left the issue alone.

After October 1976, the governement exerted a strong pressure on the press, putting restrictions on its freedom. Yet, when the ministry announced the raising of school fees for some high-quality vocational schools, the public raised a hue and cry through the press, resulting in the withdrawal of the new proposal. At times, public opinion is in contradiction with professional standpoints. For instance, in the new elementary curriculum, launched in the 1978 academic year, the English language is not included as a compulsory subject. According to the professionals, who judge by research studies, teaching English at the elementary level is not as useful as it should be, and children are frequently taught bad English; hence it would be better not to teach it at all. To the middle-class laymen, however, the exclusion of English as a compulsory subject is detrimental to their interests. Hence, when the ministry's position on this issue was declared, there were mounting volumes of protests and attacks were made from all quarters through the press. The ministry shifted its stand somewhat, but essentially stuck to its original framework.

Information and the preparation of the fourth Education Development Plan

A case-study of the interaction between the information system and the decision-making process responsible for the preparation of the fourth Education Development Plan may help us to clarify many problems and issues involved in the study of information systems. The fourth Education Development Plan (1977–81) was developed and worked out during the latter part of the third Education Development Plan (1972–76) by the National Education Commission (NEC). Within the Ministry of Education, the Education Planning Division in the Under-Secretary's Office is responsible for co-ordinating the plans of all parts of the ministry. The Education Planning Division, however, does not operate on its own. Most of the plans and projects originate in the departments, each of which has its own education planning division or equivalent, working out its own plans and projects. Hence, the Education Planning Division in the Under-Secretary's Office is at its best the co-ordinating agency within the ministry, or at its worst, a mere collector of departmental plans and projects. Outside the Ministry of Education, the State University Bureau and the Ministry of Interior (Department of Local Administration) also prepare their own plans.

THE INFORMATION SYSTEM AND PROCESS

Since quantitative educational planning is a scientific process, the information required is largely pre-determined by the theoretical framework or approach adapted. In the Thai context, no single approach has been adopted. Normally, planners are pragmatic and work under constraints. In planning for the third Education Development Plan, the enrolment figures at the primary level were set under the constraint of the population growth rate and pupils' promotion rates. Planning for the secondary level was determined by a mixture of considerations concerning financial limits, middle-manpower requirements and progression rates. Planning for higher levels attempted to follow closely the guidelines of manpower requirements. Above all, the plan as a whole was under the constraint of the economy's expanding growth rate and the government's decision on the ratio of education expenditure to total government budget and GDP.

In terms of qualitative planning, information is needed about the quality of class-room learning. Results of new experiments on learning efficiency would be indispensable for the design of new curriculum and classroom logistics. Information concerning regional disparities is also needed if equal opportunity and justice are to be the goals of educational development. In the preparation of the fourth Education Development Plan, input from proposed changes in curriculum at the primary and the secondary levels was one of the most influential factors determining the enrolment targets and qualitative design of the plan.

WAS THE NECESSARY INFORMATION AVAILABLE FOR THE PREPARATION OF THE PLAN?

Some needed data were available for the preparation of the plan, since agencies such as the National Statistical Office, the National Economic and Social Development Board and the Institute of Population Studies have long been working in their special fields. Information on population growth rate, GDP and school enrolments was available in due course. Thus, by 1976, the Institute of Population Studies published a report on the *Population Projections for Thailand (1970–2010)* as one cornerstone for the Five-Year Plan; the National Economic and Social Development Board published a report entitled *National Income of Thailand*. The statistics on school enrolments were available from the planning divisions of the departments concerned, as well as from the National Statistical Office.

Another set of vital statistics, unit costs per head, was also available. The problem here was that there were different ways of calculating costs per head for different levels and types of education. The secretariat of the Planning Committee however did its own calculation, and used these unit costs for setting the financial ceiling. These figures were later adjusted, after negotiations with the operating agencies.

Additional information which had a determining effect on the enrolment figures originated from the proposed change of the structure of the school system from 4–3–3–2 to 6–3–3. The Department of Educational Techniques was responsible for curriculum development, which involved the change. The Committee for Establishing the Framework for Education Reform, organized by the NEC, also proposed the change to 6–3–3. Once the new system was accepted (in 1975), it had considerable repercussions on secondary enrolment. By 1976, the change was accepted by all concerned, and it was agreed that the new school system would commence in 1978, with the result that secondary schools were faced with double intakes: one lot from elementary school grade VII, another from elementary school grade VI. The planning committee prepared for such an eventuality. In the final planned target enrolments for 1978, the old secondary grade I would have an intake from grade VII of about 476,080 and the new secondary grade I would have an intake from grade VI of about 552,010. The enrolment for the first grade at the secondary level was thus planned to more than double.

INFORMATION NOT AVAILABLE OR, IF AVAILABLE, NOT ACCURATE

Not all desirable information is available. Some might be available in the shape of general guidelines but is not accurate or exact enough, such as that discussed below, for example.

Manpower requirements

Although NEC commissioned a body of experts to work out projected figures on manpower requirements, the results were not too satisfactory. According to the director of NEC's planning division, rough estimates had been made concerning the manpower requirements at the high technical and professional levels, and these were used as general guideline. At other levels, particularly the semi-skilled level, research work still met with difficulty. More difficult still is the problem of estimating specific requirements for specific types of vocations. No statistics were available about these categories.

The rate of return to education

Mark Blaug originated a research project on this subject in 1970, and his recommendations were taken into consideration in planning the third Education Development Plan; yet there has been no follow-up project. Since his survey covered the Bangkok metropolitan area, more surveys at the provincial levels are needed. However, for the fourth Education Development Plan, the rate-of-return approach was not adopted.

Social demand and political trends

In the actual operation of the plan, decisions for school enrolments are often made under pressure of social demand and politics; in the past, there has not been an explicit adoption of the social demand and political model approach in the planning process. In evaluating the achievements of the third plan, enrolment figures for various levels overshot estimated targets. For instance, at the kindergarten level, the enrolment figure exceeded the estimated targets by 15.6 per cent; at the secondary level, by 20.7 per cent in the last two years of the plan. Actual expenditure exceeded the estimated expenditures by about 10,000 million baht.

Such phenomena indicated that data on social demand and political trends were not sufficiently taken into consideration in the planning process. However in the fourth plan, according to the Director of NEC's Planning Division, account had been taken of social demand, particularly at the secondary level. But it is not clear how the exact figures on social demand were worked out. Regarding political trends no informations is yet available.

Feedback information at the micro level

Another type of data needed is micro-level evaluative research data. Before a financial allocation for an individual project is made, planners need feedback information on the performance of individual projects. For instance, in non-formal education, when the enrolment for the Mobile-Trade Training Unit project fell short of the target by 46 per cent, the reason given for this was the shortage of teachers in technical subjects, e.g. electronics. Yet what we need to know is how the administrative process has been worked out, and why instructors in technical subjects are not available for the task. Reasons may lie somewhere elsewhere than in the shortage. In short, a kind of systematic evaluation is needed for future planning.

Other vital statistics

As long ago as 1972, a Planning Adviser to the Ministry of Education pointed out the almost complete lack of data in the following fields: institutional unit costs; sources of finance; availability of physical facilities; utilization of physical facilities; age and standard of existing facilities; wastage through student drop-out and repetition; field of specialization of teachers; and proportion of newly qualified teachers becoming teachers.

A research project on the cost and utilization of educational resources is being conducted by a research unit of the Educational Planning Division of the Ministry of Education; another research project by NEC into the utilization of physical facilities is nearing completion. A further project on the sources of finance of educational authorities is being conducted by the planning division. On the other hand, no research work is being done into the fields of specialization of teachers. Instead, the Department of General Education authorized a research project on whether teachers are being utilized according to their field of specialization or not. These projects should have been carried out long before the completion of the fourth plan. Since they lag behind, it is hoped that they may prove useful for the annual operation of the plan and for the preparation of operational plans.

EXTERNAL INFORMATION

Demographic statistics, figures of manpower requirements and GDP growth rates may be regarded as external information (external to the education system). Public opinion on educational issues constitutes another important source. The NEC allocated the task of screening public opinion on education issues to a section of its staff. In addition, seminars and workshops have been held with the view to structuring public and professional opinion on certain key issues such as teacher training, vocational education and non-formal education. Voluntary interest groups such as the Family Planning Association and the Protection of the Environment Society also fed in information to produce an effect on the shaping of the plan.

Information from foreign sources has also significantly contributed towards the build-up of technical know-how on planning. Some of the more important sources are the following:

1. International Institute for Educational Planning (IIEP) publications, such as the basic handbooks in the 'Fundamentals of Educational Planning' series, have been used and some even translated into Thai.
2. The APEID network.
3. Information through training programmes, such as those under the auspices

of the International Institute for Educational Planning (IIEP), the Regional Centre for Educational Innovation and Technology (INNOTECH), the International Development Association (IDA) and the International Bank for Reconstruction and Development (IBRD)—both part of the World Bank— the Asian Development Institute (ADI) and the Asian Institute of Administration and Educational Planning (AIAEP).
4. Information through foreign experts and consultants.
5. Information through regional and international conferences and seminars.

INTERACTION BETWEEN THE INFORMATION PROCESS AND DEPARTMENTAL INTERESTS

Although planning is a rational process, requiring information for arriving at decisions, the decision-making process itself cannot be purely rational. With external constraints on total financial expenditures, there simply could not be enough for everybody concerned. Hence, conflicts of departmental interests are inevitable. In this conflict situation, each party endeavours to marshal information to back up its request. For example, the working group of the Planning Committee originally allocated about 300 million baht to the Department of Educational Techniques. This fell short of the departmental estimate by 1,200 million baht. Thus, negotiation between the department and NEC started in late June 1976. NEC came to appreciate the true needs of the department through exchange of information, but nevertheless could not concede to the request as the total allocation for education had already reached the upper limit of the ceiling set up by the Cabinet. However, the compromise was brought about by a proposed loan by the World Bank. This instance illustrates the role information played in backing up departmental position.

Information and the curriculum reform

The Department of Educational Techniques is invested with authority for curriculum development. By the royal decrees of 1972 and 1976, the Division of Curriculum Development, which became the National Curriculum Development Centre, is responsible for designing curricula for schools of all types and levels below the tertiary level; the Division of Text Books (which has now become the Text Book Development Centre) is responsible for producing reading materials. The present curriculum has been in use since 1960. By 1970 it was realized that a major change was needed. By 1976, a new upper secondary curriculum was launched. By 1978 the new elementary and secondary curricula were being implemented, grade by grade; the full cycle will be introduced by 1983. The new curricula involve drastic changes in many important aspects. Some examples are given below.

First, the structure of the school system will be changed, from a 4–3–3–2 system to a 6–3–3 system (six years primary, three years lower secondary and three years upper secondary).

Second, primary education is designed for the majority of the rural youth. More practical experience is provided in the new curricula. Subjects are grouped into four subject-areas: language and mathematics; life experience; character training; and work experience. Life experience, combining academic subjects such as social studies, natural science and work experience, is designed to serve rural needs. To give more emphasis to the Thai language, foreign language teaching is excluded from the compulsory curriculum. English may be taught as an optional subject in schools which are well-equipped and approved by the ministry.

Third, secondary education is designed for development of individual skills and aptitudes. The curriculum has become more diversified, with core subject-areas and electives. The number of hours for electives increase as one goes up to higher grades. In the electives, practical arts, work experience and vocational subjects such as agriculture, industrial arts and home economics are encouraged.

Fourth, the new curriculum attempts to eliminate the concept of examinations as the screening device for the higher echelons of the school pyramid. Education is now viewed as a developmental task. Its purpose is to develop individuals according to their innate capacity and aptitudes. All the tests, when administered, should be looked upon as formative evaluation—that is to say, helping teachers to diagnose their pupils and to improve their teaching/learning process. Thus, automatic promotion at the elementary level is encouraged, with examinations only administered in grade VI. At the upper secondary level, however, examinations at the terminal grade, which before 1975 were administered by the Test Bureau (in the Ministry of Education), have been delegated to the school. This practice will hopefully be followed for the lower secondary level as well. Thus, no longer will the Ministry of Education control quality through a nation-wide examination system at the terminal grade (M. S. 3 and 5) as formerly. The standard and quality of teaching will be controlled, supervised and improved through other means, i.e. standardized tests periodically administered.

Fifth, the changing of the curriculum involves above all a change in philosophy and methods of teaching. At the root of this changing concept is the notion that teaching should be guided by goal-referenced criteria. Subject content is merely a media for attaining objectives; hence it should be as flexible and as relevant to the environment and interests of the learners as possible. The new pedagogy thus implies the change of teaching style, and to assure effectiveness of the change, teachers' guides as well as in-service training are needed as part and parcel of the implementation plan.

The curriculum changes just briefly described, are thus reformatory in nature, judged by the context of Thai education system. How did this come about? What is the decision-making structure and process for designing the whole change? Who are involved in the process? What role did information systems play in the process?

THE DECISION-MAKING STRUCTURES AND PROCESS FOR CURRICULUM CHANGE

Although the Department of Educational Techniques is responsible for curriculum development, it was earlier realized that no drastic change in curriculum matters could be made without the involvement and participation of other departments and agencies concerned. Interdepartmental committees at different levels were thus established. These committees were not conceived *a priori,* but evolved according to circumstances. They could be summarized as follows.

At the *ministerial level* the Committee for the Improvement of Curriculum (CIC) was set up by the Ministry of Education in 1970. It was composed of nine departmental heads, three supervisory unit chiefs from operational departments and the Secretary-General of the National Education Commission. The committee is invested with authority for deciding on policies, principles and structures of curriculum at both the elementary and secondary levels.

At the *departmental level,* two sets of committees were set up for material development (teachers' manuals, curriculum plans, textbooks; supplementary readings, etc.): one set for the elementary level, another for the secondary level. The personnel were seconded from different departments, but were mostly composed of supervisors, teachers and lecturers from university faculties. They served under the guidance of a Steering Committee, chaired by the Director-General of the Department of Educational Techniques.

At the *inter-ministerial level,* the Committee on Curriculum Contents and Process was set up in 1976 to serve as a connecting link between the Department of Educational Techniques (Ministery of Education), and the Education Reform Committee (under NEC). It was chaired by the Director-General of the Department of Educational Techniques, but the secretariat was a joint operation between the National Curriculum Development Centre and NEC.

At the *regional level,* each educational region set up its own curriculum development committee. There are twelve regional curriculum development committees for twelve educational regions. They are co-ordinated by the Committee for Co-ordinating Regional Curriculum Development, headed by the Director-General of the Department of Educational Techniques.

It must be emphasized that the committees and subcommittees listed were not established at the same time, but at different stages in the curriculum development process. All in all, about 500 personnel have been involved (excluding those at the regional level).

Effectiveness of the authority vested in the committees for curriculum change

At the ministerial level, the Committee for the Improvement of Curriculum (CIC) is vested with authority for the final approval of the curriculum at the secondary and elementary levels. However, since, the permanent Under-Secretary of State for Education, or the minister, is required to put his signature to a ministeral decree, regulation, or directive, the formal approval of curriculum policies still belongs to the head of the ministry. In practice, since the permanent

Under-Secretary of State for Education is the Chairman of CIC, the final approval of CIC might be regarded as decisive.

At the departmental level, which is concerned more with the detailed operation of curriculum development, the Department of Educational Techniques theoretically has the final say. However, since the implementation of the new curriculum involves the departments which control schools, i.e. the Department of General Education and, the Department of Local Administration (MOI), their opinions carry weight on the issue of implementation timing. Moreover, NEC, which is responsible for co-ordinating the planning for education reform, is also concerned with the timing for curriculum implementation. Since each agency concerned had its own view about the timing as well as about the methods, several meetings had to be called for negotiations. Finally, with the spirit of give and take, a decision was arrived at in 1976 that the implementation of curriculum change would begin in the 1978 academic year, at primary grade I and secondary grade I.

THE ROLE OF INFORMATION IN CURRICULUM DEVELOPMENT

Channels of information

The Ministry of Education has created channels of information for curriculum change and development through: (a) specific research work; (b) conferences, seminars and workshops; (c) committees and working groups; (d) linkage between the Department of Educational Techniques and the regions through follow-up and evaluation; and (e) foreign information sources. Each of these channels of information will now be described.

Research, authorized by the Ministry of Education and used by the members of the committees in their deliberations on curriculum matters includes the following projects:

'Achievement Scores of the First-grade Pupils, as Compared with the Curriculum Objectives, Parts I and II (Department of General Education).

'A General Survey of Functional Literacy of School-leavers (after the 4th Grade)' (Department of General Education, 1969).

'Effectiveness of the State Provision for Compulsory Education' (Department of General Education, 1974).

'Survey of the Vocabulary of Beginners (1964)' (Educational Research Division, Department of Educational Techniques).

'Survey of the Learning Needs of the Rural Population in 1975' (conducted by the Division of Curriculum Development, Department of Educational Techniques).

Conferences, seminars and workshops of the 1970s, which were organized by the Ministry of Education and which might be regarded as related to the process of curriculum development from the perspective of gathering information and opinions from different authorities includes:

A Seminar on the New Face of Elementary Education at Wang Kaew (1973).

A Workshop on the Elementary Curriculum at Wang Ta-Krai (1974).

A Seminar on Education for the Masses at Songkla (4–7 August, 1974).
A Conference on Regional Curriculum Development at Bangkok (1975).
A Conference on Regional Curriculum Development at Bangsaen (1976).

The bottom-up information flow occurred through such channels as the conference on regional curriculum development; whereas the horizontal information flow between the Ministry of Education and the National Education Commission and the Reform Committee group took place at the Seminar on Curriculum Contents and Process.

Committees and working groups established by the ministry are another channel for information flow among professionals on curriculum matters. As indicated earlier, about forty committees and working groups have been in operation, involving about 500 people including supervisors, schoolteachers, university faculty instructors, professionals from the private sector and officials from the Department of Educational Techniques.

Information flows between the Department of Educational Techniques and schools were also created through follow-up and official visits. In 1975, the Director-General of the department made a tour of the regions during which a general exchange of opinion took place between departmental officials, the regional and *changwad* education officers and school staff.

Foreign information sources and contact with foreign countries have also brought about some benefits to the planning of curriculum development. With the benefits of the IDA (World Bank Loan) project, short-term fellowships enabled a number of key personnel from the Curriculum Development Centre (CDC) to make study tours of the Educational Development Center in the United States, the Curriculum Development Centre in Israel, the Open University and open school system in the United Kingdom, the Korean Educational Development Institute (KEDI) in the Republic of Korea, the Curriculum Centres in Sri Lanka, Malaysia and the Philippines, and the National Institute of Educational Research (NIER) in Japan. Information gathered from these sources enhanced the perception, understanding and insight of CDC decision-makers. Texts and sample curriculum materials from these external sources have been used for informal in-service training of CDC staff and others joining the curriculum development teams.

Structuring of information

Structuring information for curriculum development took place at four stages:

1. Information concerning education inputs, products and learning processes was first structured through research work.
2. Research findings as well as recommendations were generally discussed at seminars, conferences and workshops, and structured in terms of directives for change.
3. Research findings and recommendations from seminars or conferences were selected by the committees and groups for drafting the structure and content of the new curriculum and the new materials accompanying them. There are in fact two sub-stages of the committee work: the first concerned

with drafting a general framework for the curriculum, the second with curriculum materials development.

4. After the first trial of the new elementary curriculum, formative evaluation was conducted and its findings went into the final production of the prototype materials.

The impact of information on curriculum change and development

There is no denying that information has an impact on curriculum change and development. The question is how much and in what manner. It may not be impossible to construct a fine instrument for measuring the impact of information on specific issues. However, since curriculum development embraces so many issues, it will not be possible to consider them all. A few salient issues will be considered below.

The present structure of the school system is 4–3–3–2, that is to say, four years' lower elementary, three years' upper elementary, three years' lower secondary and two years' upper secondary. The new system of 6–3–3, although taking the same twelve years to complete the cycle, is split up differently with six years' elementary (in one cycle), three years' lower secondary and three years' upper secondary. The difference between the two systems of course is not just in physical appearance, but involves substantial changes. In the 4–3 elementary schooling system, only 60 per cent of those finishing the lower four years could get places in the upper elementary level. Thus, in fact, the seven years' compulsory education for all (according to the Karachi Plan) remained a paper target, not actually carried out. The new six-year elementary system, however, means compulsory six years of education for all. There will not be a sharp break between the fourth and fifth years. At the secondary level, the difference between the 3–2 and the 3–3 system is obvious; the latter cycle is one year longer and hence might be used for more specialization in subject-matter. The issue we are concerned with is what caused adoption of the 6–3–3 system.

In reality, decision-makers at the subcommittee level considered the elementary and secondary schooling systems independently. The subcommittee on the elementary curriculum treated elementary education as a separate issue. The committee members decided to adopt the six-year elementary system sometime in 1974. An interview of the key decision-makers revealed that the preference for the six-year elementary system was based on four grounds. First, according to research findings, parts of the curriculum content of the 1960 curriculum were repetitive, parts were inessential and superfluous and thus could be left out and systematized so that it would take only six rather than seven years of schooling to complete. Second, according to another research finding, although 180 teaching days per annum were prescribed by the regulations, a wastage of 35 per cent of time occurred through misuse of school days for other purposes. It was further pointed out that if the school days were extended to 200 days per annum (the average figure for most Asian countries according to Unesco), the six-year elementary cycle could prove more efficacious and more cost-effective than the present 4–3 system. Third, according to a report on financial analysis, the financial burden for implementing the seven-year elementary system is too much to bear. By reducing the length of compulsory schooling, there is a better chance of implementing the universal six years of elementary education by 1983. Breaking up the schooling system into 6–6 is thought to be more in accord with stages of child development than 7–5, assuming children enter school when 6 years old. An experiment at Chulalongkorn Demonstration School, in which seventh grade children (13 years old) were transferred from the elementary school compound to the secondary school compound proved quite satisfactory. These reasonings were shared by committee members. Thus, by 1975, the six-year elementary had been approved. In evaluating the impact of information on this issue, it can be said that research findings from the report on lower elementary education, the report from a study on time wastage during the academic year 1963 of schools in Thailand (by Maitri Thumchai *et al.*), the report on the effectiveness of the State provision for compulsory education (1972), Nicholas Bennett's papers and a report on the problems of financing the Thai educational system, Unesco's report on the first level of education in the Asian region, theories of child development, experiments from the Chulalongkorn Demonstration School, and reports of the Subcommittee for Elementary Curriculum Analysis, all had an impact on the new proposed change of the schooling system.

At the elementary level, grouping subject-matter into four integrated areas, i.e. skill subjects, life experience, character training and work experience, was influenced by a number of factors.

First, the Subcommittee for Elementary Curriculum Analysis found that the contents of the existing curriculum (1960) did not place enough emphasis on the affective domain. Therefore, it decided to separate this area for emphasis, and called it 'character training', or more fully 'learning activities to promote character and personalities'. The emphasis would be on activities rather than on the acquisition of knowledge concerning moral values. In short, the decision-making on this issue was influenced by the findings of the Subcommittee for Elementary Curriculum Analysis, which were based on research findings from the Department of General Education.

Second, the grouping of social studies and natural science into the integrated area of life experience, with emphasis on problem-solving and the interest-focus approach or the so-called integration approach, was finally adopted as a result of deliberation at the Wang Ta-Krai seminar in 1974. The influences leading to such a decision might be traced to general research findings showing that children in the past learnt science and social studies through rote memorization and did poorly in the examinations. The integration approach was adopted with the view to encouraging children to learn from interests relating to their environment.

Third, work experience is a new area gaining interest. Neither the Subcommittee for Elementary Analysis nor previous research findings gave direct consideration to work experience. However, by 1973 ideas were abroad that learning through practical experience could be as effective or even more so than through conventional academic methods. In the report *Learning to Be*,[1] which was much talked about in 1973, practical experience was highly lauded. At the seminar at Wang Kaew in May 1973 on the New Face of the Elementary Education, one of the keynote speakers agreed that education for the rural youth should give considerable emphasis to work experience, and less to academic subjects. The participants agreed that curricula should be made flexible and more responsive to local needs. In the period after the great student uprising of 14 October 1973, the students' movement called for a new curriculum, as responsive to local needs as possible. Thus in April 1974 when the seminar on the elementary curriculum was held at Wang Ta-Krai, the participants agreed to single out work experience as a separate area once they had been reassured by the chairman that such a subject at the elementary level had been introduced into the curriculum of some East European countries.

At the elementary level, the new curriculum is characterized by learning objectives and learning concepts. The detailed specification of learning objectives and concepts is largely influenced by a new approach in curriculum development which emphasizes goal-referenced curricula. Research findings from the actual practice of the existing curriculum also mentioned that the objectives of the existing curriculum were too general and vague, without a breakdown by grade. Teachers could not find any guideline for classroom practice. To improve upon this situation, and in keeping with the new learning theories (that learning is a change of behaviour), behavioural objectives were introduced as a guideline for the curriculum.

The new elementary curriculum stresses teaching the Thai language and excludes English from the compulsory curriculum. The Thai language, the mother tongue, is given priority during earlier years. An interview with the key decision-makers at the subcommittee level indicated that the spelling method was an essential technique for teaching the Thai language, while at the same time experimental research showed that the word/sentence method (Gestalt approach) helped to speed up reading capability. A balance between these methods has been adopted.

The exclusion of a foreign language from the syllabus was based on research findings that teaching English in Thai schools was ineffective; most teachers were not proficient in the language. Other research findings showed that no significant difference existed in the final achievement between those who started learning at the lower elementary level and those who started learning at the upper elementary level. The subcommitttee thus agreed to exclude English from the regular syllabus with the hope that more time would be available for the Thai language and work experience which would be useful for the majority of children in the rural parts of the country. However, to maintain the flexibility principle, the Subcommittee for Elementary Curriculum Analysis did not entirely prohibit the teaching of a foreign language, but treated it as an optional subject which may be taught as part of life/work experiences in integrated areas.

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[1] E. Faure, *et al.*, *Learning to Be. The World of Education Today and Tomorrow*. Paris/London, Unesco/Harrap, 1972.

As far as the changing concept of examinations is concerned, at the upper secondary level, the change is drastic, for whereas, before, a final examination was administered by the ministry to all students at the terminal grades of the upper secondary level, the new regulation of 1975 gives the responsibility for examinations to schools themselves.

At the elementary level, as contemplated at present, a semi-automatic promotion will be instituted, with a final examination for the terminal grade VI, still controlled by the ministry. By 'semi-automatic promotion' is meant automatic promotion between grades I and II and between grades III and IV, with examinations or tests set by schools themselves at grades II and IV. In addition, the new curriculum encourages teachers to apply tests as instruments for diagnostic and formative evaluation throughout the school year. The principle behind such changes is to give more emphasis to testing as part and parcel of the teaching/learning process, and to reduce its importance as a screening device.

Influences for more drastic changes at the upper secondary level, and more gradual change at the elementary level, emanate from different sources.

When the new upper secondary curriculum was launched at the beginning of 1975, the climate of opinion (professional and political) was in a state of flux. An equivalent of a de-schooling movement *à la* Ivan Illich could be seen in embryonic form. Both the Education Reform group and the students' movement were vehement in their attack on the educational system as a diploma-mill system, in which certificates were worshipped, and viewed the examination system as an instrument for class-stratification. Among the important publications of the students' movement is *Education for the Mass*, which includes Nyerere's speech on 'Education for Self-Reliance', and articles by Seksal Prasertkul and Nicholas Bennett. The professionals and the policy-makers in the ministry, however, did not have to come into contact with such a publication directly to realize the faults of the system as pointed out by Nyerere or Illich.

The delegation of examination authority to the school was made on two grounds. First, the new curriculum involved a credit system in which students could take up electives according to their choices, and hence a standard examination by the ministry would be inappropriate. Second, it was felt that examinations should be treated as part and parcel of the teaching/learning process, and accordingly schoolteachers should use the tests as an instrument for diagnostic and formative evaluation and be responsible for all examinations.

At the elementary level, the evaluative system as currently conceived has been influenced by various sources. A report of the Seminar on Problems of Repeaters in Elementary Schools (1966) and an experiment in automatic promotion carried out by the Department of General Education suggested that semi-automatic promotion was possible. This system would go hand in hand with the curriculum design which provides for formative tests of behavioural or learning objectives throughout the year. The ministry now insists on its own final examination at the terminal grade VI, partly from the professional concern that schoolteachers may not be ready to enjoy full freedom in their instructional responsibilities, and partly from a certain apprehension that parents might misconstrue the policy of the ministry as one of neglecting 'national standards'.

If the new elementary curriculum had been launched in 1975, in the heyday of liberal politics, the ministry might have reacted differently.

Unlike the upper secondary curriculum of 1975 which was really completed before publication of the report of the Committee for Establishing the Framework for Educational Reform, the working out of the lower secondary curriculum was guided considerably by the recommendations of the reform report. The principles of the new lower secondary curriculum stressing the potential development of the individual according to his own aptitudes and interest and the adaptation of curriculum content to suit local needs are in line with the recommendations of the reform report. On the other hand, the organization of the curriculum structure does not follow exactly the scheme envisaged by the reports. According to the reform report, there should be three groups of subjects:

1. Compulsory subjects, including languages, social studies, science, mathematics, ethics, art, music, physical education, etc.
2. Optional subjects, which are divided into three groups: (a) academic subjects; (b) practical subjects; (c) subjects complementary to group (a) or (b).
3. Free electives including subjects which are functional and complementary to both compulsory and optional subjects.

However, the curriculum contents and structure of the new lower secondary syllabus specify only two types of subjects:

1. Compulsory subjects, which include the Thai language, science, mathematics, social studies, physical education and health, arts, so-called extra-curricular activities, and work experience.
2. Free electives including a foreign language, physical education, arts, vocational subjects for grades 7 and 8, a second foreign language, and mathematics for grade 9.

The proportion of time allocated to compulsory subjects expressed as a ratio to free electives is just under 5 to 1 for grades 7 and 8, and just under 2 to 1 in grade 9. Thus, in fact, students cannot really choose much during the first two grades. On the other hand, the new curriculum leans heavily on the compulsory principle, interpreted liberally to include practical subjects such as arts and work experiences; household care and chores, needlework, home economics, agriculture and household mechanics are offered as optional subject-areas within the compulsory core.

In short, the lower secondary curriculum follows the general guidelines of the report of the reform committee in so far as general principles are concerned, but works out its own structure and considerably limits the principle of freedom of choice envisaged by the reform group.

From the foregoing discussion of the role of research and information on the process of curriculum development, it may be said in general that, where general principles and concepts are concerned, decision-making on curriculum matters is a rational process, influenced largely by research work and professional opinions. In terms of detailed operation, which has not been given consideration at this level of analysis, a number of constraints may be at work, chief among which may be personal interests, physical limitations concerning school facilities and personnel, and specialized thinking.

13 Upper Volta

Aimé Damiba

Introduction

When France granted internal autonomy to the Upper Volta in 1957, a national of the country took over education for the first time. Between 1957 and 1977, a succession of twelve ministers followed one another at the head of the Department of Education, an average of one every twenty months. This in itself prompts some concern about the continuity and coherence of the decisions taken in the sphere of education and its development over the last twenty years.

It should be noted that decisions may be taken at the supreme level, that is to say by the President of the Republic in his role of defining and directing national policy, at the ministerial level, at or local-authority level. Educational development is governed by these three decision-making levels. First-level decisions relating to the educational system as a whole in its quantitative and qualitative aspects are rare. Decisions at the second level are numerous but their scope is limited to internal rearrangements of the educational system and curricular changes. Financial decisions, which give reality to the power of decision, are not in the hands of the Minister of Education, as his budget consists of three major items whose scope for innovation is nil. These items are staff expenditure (set out by name in the government budget), expenditure on scholarships and student maintenance grants, and the appropriations for equipment, which are exactly the same from one year to the next with a 1 per cent increase—totally out of proportion with the present rate of inflation.

In the final count, the decisions that have had the most positive or negative influence on the development of education are those of the local authorities. Theirs is the responsibility for building and maintaining primary schools.

To get a clearer idea of the decision-making process and to measure to what extent information essential to decision-makers is available and effectively used, we will concentrate on a fundamental continuing problem affecting education in the Upper Volta, namely that of an educational system matching the country's development requirements and at the some time compatible with its limited resources. We shall deal with three major stages: the decision to institute rural education, the decision to convert this into the training of young farmers and lastly the decision to embark on educational reform.

The institution of rural education

Seventeen years ago, it was decided that:

> there shall be instituted for the implementation of the rural schooling plan for expanding education in the Upper Volta a rural education service under the authority of the Minister for National Education assisted, at the level of curricula and execution, by a co-ordinating committee consisting of the Ministers of National Economic Affairs, Public Health and Population.[1]

The aim of this was to draw in all young people of 12 to 15 who had not been to school and to give them elementary instruction and rural and civic training. Instruction covered a period of three years and was given in rural education centres (CER) set up in rural areas.

THE INFORMATION SYSTEM

Until 1960, no detailed information was available on education. Reference had to be made to files that were accessible only with difficulty at scattered points in France, Senegal, Mali, the Ivory Coast and the Niger; this resulted from many changes in structure, the most important of which was the dismemberment of the country for the benefit of its three immediate neighbours between 1932 and 1947. For the more recent period, the inspection reports and the central administration's reports were the only source of information.[2]

In spite of these conditions, it was possible to compile general data for a period going back to 1954, but detailed studies on flows, performance and cost were possible only for the very last years prior to independence, and it was the period from 1957 to 1959 that, in fact, served as a basis for the first studies of this kind, carried out by Christol and Médard.[3]

The conclusions may be summed up briefly as follows. The enrolment rate was very low, 6 per cent, and performance was bad—50 per cent of the pupils did not reach the sixth school year. As regards examination successes, slightly less than half the final-year pupils passed their certificate of elementary primary studies (CEPE) and only 15 per cent won a place in secondary education. The unit cost per pupil was about 12,000 CFA francs, equivalent to the annual average income. Education was costing more than the country could afford; in 1959 it swallowed up 23 per cent of the government's budget and its effectiveness was questionable. Hence the consequent use of a cost-effectiveness model which indicated the following measures: reduce the length of the elementary cycle of education by half, allow no repetition of grades, and reduce teaching costs by half by recruiting at a lower level. As to the relevance of the system, an introduction to the basics of modern agriculture was proposed with the object of improving productivity, together with civic training to gradually bring about a change in attitudes. These were the proposals for a new educational system to be introduced on the basis of a ten-year plan and aimed at 140,000 young people between 13 and 15, including 20 per cent girls, who would revolutionarize the rural areas and increase agricultural income.

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[1] Decree no. 237/PRES/EN of 14 June 1961.

[2] The first compilation of school statistics relates to the 1963/64 academic year.

[3] Christol and Médard. *Rapport sur les Problèmes Posés par la Scolarisation dans la République de Haute-Volta*, SEDES, 1959.

THE DECISION-MAKING PROCESS

The mission undertaken by Christol from the Société d'Étude et de Développement Économique et Social (SEDES) and Médard from the Institut Pédagogique National (IPN) resulted from a request for technical assistance made by the Upper Volta to France. Was the mission suggested to the Upper Volta or was it effected at the Upper Volta's spontaneous request? Experience indicates that most missions are suggested and all the more easily accepted when the carrot of foreign funding is dangled. What is more, in 1959 the whole of the Upper Volta administration at the senior level was in the hands of French officials from the colonial era. Could this be the explanation for the success of the Christol–Médard report?

The report went through the usual channels—consideration by committees and delivery of opinions—and was taken over by the administration. It was presented to the National Assembly in the form of a 'rural schooling plan for expanding education in the Upper Volta' and adopted by the Assembly's social committee (Report No. 20/59/AC, 19 November 1959). What happened during the twenty months from the date of adoption to that of the government's decision to bring in rural education? Probably the developments in the life of the nation that were to lead to independence in 1960 took precedence over all other activities. Or was it simply that political authority with the necessary strength to take a major decision was lacking?

When analysed, the decision to institute rural education was based on the logic of techniques and figures. One might have expected, in view of the scale of the programme, preliminary measures in the way of sociological surveys, information campaigns and steps to encourage participation so as to bring about democratic acceptance of the decision by the populations concerned. Instead, the decision smacks of that paternalistic benevolence that is satisfied with itself for having proposed something for those left out of the conventional educational system. This is evident from the fact that rural education was devised as a form of transitional schooling ancillary to primary education with which there was no kind of competition. This attitude does not line up with the basic finding in the Christol–Médard report to the effect that the educational system has proved itself and that those responsible have done everything in their power to develop a high-quality educational system as rapidly as possible and have succeeded in the framework of an assimilationist tendency which imposed itself on them for purposes of building up as highly-qualified an élite as possible. But one cannot see, when one child out of fifteen has a place in the primary schools, how the other fourteen are going to be able to get there as well.

ROLE OF THE SPECIALISTS

In 1959, no Upper Volta national had a position of responsibility in the central administration. This suggests that the role of the technicians was essentially that of the French technicians, beginning with the suggestion of the rural education idea, its development in the form of an educational programme and its implementation. For example, the original team that launched the rural education project had a staff of eight, of whom only two were Upper Volta nationals.

Thus the fact that the decision taken by the policy-makers was based on information produced solely by foreign experts and was to be implemented by foreign officials was clear from its nature. It was intentionally partial rather than general, as the analysis of the system suggested was necessary. There was no total conviction as regards the soundness of the decision.

The conversion of rural education into young farmer training

The launching of the young farmer training scheme came as a truce in the controversy on rural education which split the Upper Volta into two camps, each of which found allies elsewhere.

THE DOMINANT ROLE OF OUTSIDE INFLUENCE

At the Congress of the National Union of African Teachers in Upper Volta (SNEAHV) in 1967, the Inspecteur d'Académie,[1] the highest official in education next to the minister, was asked the following question: 'Would you be prepared to send your son to a rural education centre?' This question sums up very well all the criticisms levelled at rural education—second-rate schools for second-rate citizens. In effect, a principle of 'separate development' prevailed at the opening of rural education centres not 10 kilometres away from conventional primary schools. Under a second principle, 'development by area', whole regions were earmarked for rural education which offered no chance, or at least not the same chance, of social advancement. These prospects called forth protests at injustice expressed either openly or in mute inertia. The decision-makers were aware of the inequalities of the educational system but they could only resign themselves to seeing those inequalities become institutionalized in this way, undermining the apparent unity of an apparently democratic educational system.

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[1] This high-level position was Africanized in 1965 and given to Joseph Ki-Zerbo.

INFORMATION ON RURAL EDUCATION

After ten years, all the basic quantitative and qualitative information on rural education was available, compiled by the national services and supplemented by numerous reports of assessment missions.[1] Here it will suffice to sum up the main conclusions drawn from the mass of information available. The scheme's quantitative objectives were only 19 per cent reached.[2] It was rare for rural education centres to have the required total of forty pupils; a drain of about 60 per cent took place between the beginning and end of the school year. In 1971, there were 800 rural education centres with a maximum capacity of 30,000 pupils. The accent, in the rural education scheme, was placed on production which was expected to finance operating costs. In fact, output from agriculture, craft trades and breeding was insignificant. It was found, for example, that for plantations, the rate was lower than one tree per pupil per year.[3] As regards intellectual skills (reading, writing and arithmetic), 50 per cent of the pupils had acquired knowledge that could really be used by the end of their schooling but this was practically all lost after three years.[4] Regarding the basic object of rural education, namely the change of attitudes in rural areas, 'it has to be admitted that they [ex-rural education centre pupils] have not managed to have the agricultural methods learnt from their teachers accepted in the family circle and that they do not even use them in their own personal plots of land'.[5] In our society, so much dominated by older people, innovation is introduced more by people of 40 than by the young. Another aim of the rural education system was to keep young people on the land in their own area. Data collected by the rural education directorate show that 50 per cent of ex-pupils stay put but no one can prove whether that is an effect of the education they have received. Similarly it is impossible to establish any precise correlation between education and emigration.

THE DECISION

Should the scheme be abandoned and expenditure halted? Talking about rural education, the Prime Minister in his programme speech said:

> Our present educational system has two structures at primary level: rural education and traditional education. The former has a more practical nature but its cycle is perhaps a little short. The latter gives only theoretical knowledge rarely related to the needs of the child and of the environment. The priority in this field is gradually to combine these structures so as to form one single system so that a real job can be made

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[1] A short bibliography on rural education contains nearly twenty titles of books and various articles.

[2] *Education Rurale dans le Yatenga et le Sud-Ouest*, Paris, SEDES, April, 1972.

[3] Ibid.

[4] Isabelle Deblé, *L'Education Rurale et la Diffusion de Nouvelles. Techniques Agricoles en Haute-Volta*, Université de Paris, IEDES, 1973.

[5] Raymond Lallez, *Innovation in Upper Volta: Rural Education and Primary Schooling*, Paris, Unesco: IBE (forthcoming).

of teaching. In this way not only shall we be able to produce productive adults but it will be possible to increase the very low enrolment rate that has been at a standstill for several years.

What followed from this statement? External aid (European Development Fund, the World Bank and the French Aid and Co-operation Fund) was prepared to do something for rural education, but what? A clear, definite distinction had to be made between rural and first-degree education. For this, a change in name was necessary and the term to be used from then on should be the training of young farmers. For this to be effective, entrants should be 15 years old and physically strong. Productive work would be strengthened by the conversion of the rural education centres into teaching farms. Knowledge would be better acquired if taught in the local language. To implement all these measures, the system had to be placed under a ministerial department for production, in this particular case the minister responsible for rural development.[1] On these conditions, foreign aid would give the experiment a second chance by providing investment, equipment and technical assistance. I shall say nothing about the committee meetings that Upper Volta technicians were forced to attend to 'consider the reform of rural education'; the only purpose of these meetings was to approve the proposals of the providers of money.[2] With regard to bringing the scheme under the ministry for rural development, for example, it is certain that the Minister of National Education never proposed a draft decision along these lines to the Council of Ministers. On the contrary, like many of his colleagues, he must have thought that the rural education system had developed an approach to educational problems constituting a continuous call for a general reform of the educational system combining the most positive elements in the two systems. The decision was taken at the highest level, the Minister of National Education being told that the government could not leave a present of over 1 billion CFA francs on the doorstep without taking it in.

In short, the decision to convert the rural education scheme into the training of young farmers was based on adequate information. The national technicians generally compiled the quantitative data and the foreign experts drew up the qualitative assessments. But this collection of information was mainly used to justify applications for external finance in the presence of which the internal decision-making process was reduced to a rubber-stamping procedure which left untouched the basic problem of introducing an education system into the Upper Volta designed to promote development and open to all.

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1. In the main these were the conditions laid down by the World Bank for the grant of a loan.
2. Decree No. 72-149/PM/ENC of 21 July 1972 regarding the setting up of a commission for the reform of rural education.

The decision to embark on fundamental educational reform

Only an internal national decision could bring about a real reform of the educational system. This internal character applied both to the information system by reducing the foreign role to the minimum and to the decision-making process by ensuring participation, the reason for which lay in the very nature of the decision to be taken where political logic had to take precedence over technical logic.

THE INFORMATION SYSTEM AND THE REFORM PROCESS

In May 1972 when the plan was submitted to the National Assembly, the Minister of National Education was severely criticized by the opposition for producing a plan in the form of a set of projects but omitting the essential, i.e. educational reform. The positive response to this criticism was the setting up of an educational planning department responsible, among other things, for thinking out the process of reform for the educational system. This in fact involved the setting up of an effective system of aids for decision-making which fully materialized in 1974 with the reorganization of the High Council for National Education and the Educational Planning Directorate.

The High Council was set up in 1964 with the widest possible powers. It gives its opinion to the Minister of National Education on the following questions: educational development and orientation; educational programmes and methods; school attendance rules and administrative and disciplinary regulations; the building and opening of educational establishments; public libraries; cultural organizations; adult education; fine arts and research. In fact, the High Council was largely inoperative.

Although in 1964 the ministry's general organization set up an educational planning department, it existed only in the form of the school statistics section.

The reorganization of 1974 merged these two bodies, which up till then had led a lonely and fruitless existence. An Educational Planning Directorate was set up with staff and working facilities and became the secretariat of the High Council for National Education, thereby allowing it to fulfil its role, to aid decision-making or, in other words, to plan education.

The planning department was not brought into being from nothing. It benefited from the work carried out by Unesco experts and French technical assistants, particularly in the collection of educational statistics, their use for cost-effectiveness studies and the development of planning methods in relation to social demand or manpower requirements. It was à la carte planning to match available resources and expected foreign aid. From 1972 on, planning was oriented towards educational reform.

Everyone agreed that defining new educational objectives can only be done among nationals away from any direct foreign influence. This would involve no foreign experts in the educational planning department. But it would be wrong to minimize indirect foreign influence, through international conferences, colloquia and seminars, and visits to the country. These offered national policy-makers excellent opportunities for exchanging ideas and information on concepts, methods and techniques, and in this field the role of Unesco was particularly important, as was that of IIEP through its training and document-distribution programme. These affected varying publics: decision-makers, technicians and especially members of the educational planning department. This explains how, at national level, greater attention came to be paid to certain ideas such as basis education, continuous education, the development of vernacular languages, the integration of education into the environment, education and productive work, education and the affirmation of cultural identity, equality, non-discrimination in education, etc.

The process of educational reform may be analysed as a process of communication for purposes of basic decision-making. There were three clear-cut phases: the commitment of the national education administration, the involvement of the population, and the resolve of the government.

Senior staff in the Ministry of National Education received details concerning the assignment of responsibility for conducting the long and complex reform operation at a ten-day seminar (July 1973).

In order that reform would be an achievement of national construction by a democratic process, ways in which the population could participate had to be devised as early as the phase involving expression of needs. For this purpose, a programme to inform and mobilize public opinion was launched consisting of surveys, seminars and discussion-type conferences, individual and collective contact methods. This campaign to awaken awareness reached a vast public consisting of pupils at all levels of education and illiterate and literate adults.

Though there had always been a desire for reform in the Upper Volta, ideas had never been so lucid, options so clear and the will to succeed so strong. Compared with the past, the present situation has the slight advantage that a process exists through which the government should be able to make its own policy choices.

In fact the sole purpose of the surveys, seminars, etc., was the provision of material required for the submission to the government of a project for educational reform.

On the basis of its first consultations, the educational planning department produced a document entitled Educational Reform—Initial File. It was a first synthesis of the opinions expressed in favour of a new form of education—an education for the masses based on the use of vernacular languages and the integration of education with socially and economically productive work. The merit of this 'initial file' lay in the many questions it raised in terms of a challenge as regards policy (what society for what education?), techniques (new programmes, methods and teaching equipment) and finance (the resources for mass education).

The discussion and research on these questions led to the publication of another file intended to help the government make policy choices, thereby giving momentum and a more precise direction to the educational reform movement.

WHEN WILL THE DECISION BE TAKEN?

The reform process described has been under way since 1972 so one might well ask when a decision will be taken.

The timetable for implementation starts from the date at which the reform proposal was available and provides for two five-year periods, the first for research and experiment and the second for general application.

Today, fairly unanimous agreement may be said to exist as to the main guidelines for educational reform, namely to promote a mass education system based on the use of vernacular languages, on socially and economically productive work in a perspective of primarily rural national development and the affirmation of the African cultural identity. This mass education will come out of the internal efforts of communities organizing themselves into educational centres where the educational effort will be shared among all aspirants to knowledge—pre-school children, the young, and adult men and women.

A long technical preparation will be necessary to develop the vernacular languages to the point where they can serve as a basis for education (transcription, codification and the production of teaching material). Integration of the various elements of the national culture (songs, dances, literature and crafts) into the educational process calls for careful study. The integration of work into education to the point where any production activity has its own educational component and every unit of education is also a unit of production needs to be demonstrated by concrete experiments. At the pedagogical level, the preparation of new programmes and the training of teachers are difficult tasks. A success can be made of all these activities; there is international and African expertise in all these fields that can serve as a foothold but technical demonstration is not sufficient to move from the first phase to the second. Courageous policy decisions are necessary.

There are some sixty different languages in the Upper Volta, three of them covering about 60 per cent of the nation; in the long term, these will impose themselves on the others in a slow process. But to elevate them to the rank of teaching languages, even without imposing them on the others would be to give them a great power of domination. For this reason, the minority language groups are becoming aware of the danger and organizing themselves to protect their interests.[1] How are these languages to be introduced into the country's administrative life? How can their development be furthered without encouraging regionalistic tendencies counter to national unity?

The use of vernacular languages in education and the integration of education into rural development raise the regionalization problem. At present, national development is chiefly a matter of development in the capital and urban centres which drain away the production and life of the rural areas. How can the regions' future be defined with some degree of specificity and independence in the meeting of basic needs which will not harm national unity?

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[1] This, incidentally, explains the increase in the number of vernacular language commissions in recent years, which now total ten.

The integration of education and production raises questions concerning not only the education system but also the production system. If work is to be an opportunity for all citizens to learn, to raise their levels of knowledge and skill, and to develop culturally and spiritually, it must not take place in conditions that are purely and simply soul-destroying exploitation but rather in those that give broad scope for collective participation.

If all pupils from schools are to take part in socially and economically productive work, then society must no longer regard them as burdens; it must organize itself to give them a share of responsibility for economic and social life. This will demand the co-ordination and integration of all the commodity-producing processes in the community.

THE ROLE OF NATIONAL AND FOREIGN TECHNICIANS

In the process that has just been described, it is clear that the role of technicians is important and complex. In a first phase, it is mainly the work of national technicians that will be involved and this is a *sine qua non* for the success of the operation. The national technician is therefore committeed and cannot remain indifferent or neutral with regard to the proposals that he puts forward and the procedures in which he takes part. The ambiguities of the situation can be seen immediately. He will have his own opinions and hold his own political ideology which may or may not be the same as that of the authority in power. Even so, there is always an objective character in educational planning, namely the description of facts and their causes, the forecasting of enrolment, the extrapolation of trends and in brief a set of techniques which always brings out the contradictions or coincidence between declared policies and real policy shown by the facts. In this respect, national and foreign technicians play the same role, a role which is not neutral in either case.

A reform proposal, which is always an ideal declaration of principle, is followed by the technical studies for which qualified nationals are not always available. It will probably, therefore, be necessary to call on foreign technical assistance for drawing up programmes and preparing teaching material, for designing the occupational system for the teaching staff and for training teachers. Technical difficulties may lead to a reconsideration of the objectives and great lucidity and firmness will be needed not to betray them.

But the greatest dangers will arise when it comes to looking for finance. In the present administrative context of the Upper Volta, there is an insufficient intersectoral information exchange and co-ordination difficulties are apparent; foreign finance may, intentionally or unintentionally, help to raise obstacles to the achievement of objectives and may, in certain cases, cause them to be altered. The political, economic and moral interests of foreign aid are so varied that it is illusory to think they can be co-ordinated at the level of one country without that country's active will and the disciplined conduct of the various officials. What has been said earlier is sufficient grounds for these fears.

Conclusion: utility of techniques and models

Educational administration and planning specialists have adapted modern management techniques to their field. In the Upper Volta context, they are rarely used; the prospect of educational reform shows the administration's difficulty in mastering the operations that have to be carried out, mobilizing resources and ensuring participation by the population.

As regards educational statistics, the issue of the bulletin is two years late and the information collected is incomplete since it does not cover training facilities that do not come under national education or extramural activities and literacy programmes. The information collected about students in tertiary education is very general and far from precise because of the dispersal of Upper Volta students throughout the world. The use of a computer comes immediately to mind.

In these conditions, it is difficult to plan in relation to manpower requirements, for example. This has been illustrated clearly this year by the fact that the Ministry does not know to which sector to steer the 802 *baccalauréat* holders, because needs are not expressed; the deciding factor is therefore the pupil's personal taste and that of his parents, corrected by the profile of his secondary studies. A second problem is the obvious difficulty in placing all students since the capacity of Ouagadougou University is limited, African universities limit the number of foreign students they take in and sending them to Europe comes up against the problem of early registration. The Finance Minister is troubled by another fact—the maintenance of all Upper Volta students costs more than 1 billion CFA francs a year whereas Ouagadougou University does not cost more than 300 million to run. The question arises of whether a bolder policy for national higher education would not have paid off in terms of rationalizing budgetary choices.

From another standpoint, educational reform could have been strictly planned, at least as regards all the technical studies, with the relevant allocation of human and material resources. In the absence of this planning, the process is painfully slow and at the mercy of political hazards which, even so, do not bring its development to an absolute halt. Simpler problems like the building of school establishments fall into excessive arrears because of the absence of forecasting or operational planning. Use of the PERT system would have been invaluable.

The reform file was issued to senior civil servants in central government departments in order to collect their views, comments and suggestions but replies from sectors other than education were few in number. In this situation, suitable use of group techniques or questionnaires based on the DELPHI method would have given better results.

The explanations for this situation are very simple in Upper Volta's case.

First the administration is obviously underequipped and this is particularly so for the Ministry of National Education. An evaluation of all the premises of the central administration (scattered throughout the town) show an average space availability of 4 square metres per official. This makes it difficult to increase the number of staff. A second feature is the level of staff qualification. In most cases, administering means improvising. From junior officials up to central administration directors, there are very few who have had any administrative training. This situation will be solved satisfactorily when responsibilities are more accurately defined, a distinction drawn between framing long-term policy, operational management and general administration, and each of these tasks entrusted to professionals capable of taking them on. Lastly, education is part of public administration, and it is highly unlikely that the former will be modernized unless the latter is.

PART III

EDUCATIONAL INFORMATION NETWORKING

14

Communication channels for educational policy

Hans Reiff

This article was originally intended to serve as an annotated agenda to the Unesco symposium on future programmes of information and communication in educational policy and planning.

Following a guideline for the discussions, the article reviews some of the problems encountered by educational policy-makers and planners in obtaining useful and relevant information for decision-making. The second part deals with the availability and quality of educational development information and its channels of communication from the point of view of researchers and other producers of information. Finally, the last part deals with the potential future role of information networking in educational policy-making and planning.

Proposing a framework for discussion

The problem at hand is complex, involving dimensions of educational policy, planning and decision-making at the national and regional levels, combined with information sciences.

The paper attempts to open the policy 'black box' with a view to indicating that in the information model, there is a vital need for producers to learn about the decision-making process and its information needs.

For this purpose, the simple framework shown in Figure 14.1 is proposed.

While the framework shown is conceptually incomplete (everyone involved in education is by definition both a consumer and a producer of information),[1] by presenting information as one of the factors of production in the educational development process, it could guide discussions on interlinkages between information and the various stages of the educational development process.

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[1] In some situations, however, the 'producer' of information may have a direct impact on resource allocation while the 'translator' often has a productive role in selecting and editing information to reach the policy-maker. In view of this, an alternative way of presenting the sequence would be through an analysis of dissemination processes rather than of actors and their roles.

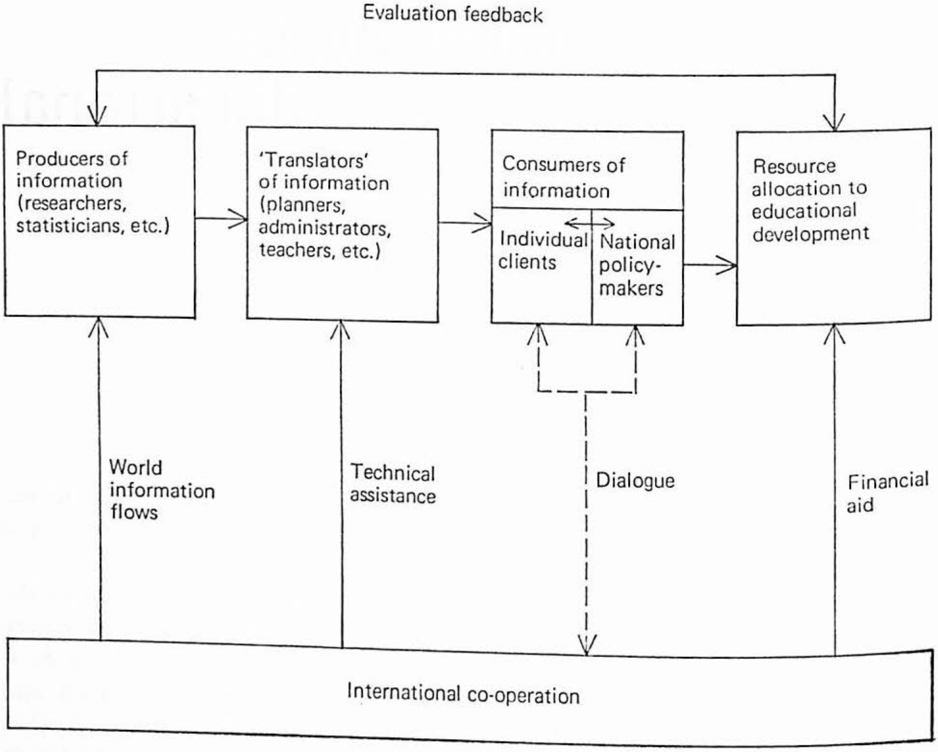
Evaluation feedback
Producers of information (researchers, statisticians, etc.)
'Translators' of information (planners, administrators, teachers, etc.)
Consumers of information
Individual clients
National policy-makers
Resource allocation to educational development
World information flows
Technical assistance
Dialogue
Financial aid
International co-operation

FIG. 14.1.

The challenge is eventually to find ways and means of establishing the balance between these different components of international co-operation with a greater focus on the role of international information flows in educational policy and planning.

Problems encountered by educational policy-makers and planners in obtaining and utilizing information

Discussions with educational planners and policy-makers often leave us with the impression that the gap between the information and research produced on the one hand and their usefuless for decision-making purposes on the other is hardly narrowing. Questions posed to educational planners regarding the use of information and research for guiding the policy-makers in the allocation of a country's scarce resources to education have often resulted in replies like: 'The statistics and research produced are hardly policy-relevant and, anyway, policy-making in education is influenced by more than the knowledge which statisticians and researchers could produce.'

Such remarks should not surprise us. Education is a vast area with multiple objectives involving many vested interests; the exchange of policy-relevant information is not likely to occur without the creation of specific incentives and extra effort. Even if educational and other development information reaches the policy-maker in a form which he can absorb quickly, his interpretation of this new knowledge will often depend on the political situation of the bureaucracy in which he is working as well as on certain subjective factors. In reality, if different pressure groups in society prevent an increase in the degree of 'openness' to educational change, then even the 'best' information will not be translated into innovative programmes.

The role of educational planning in promoting the exchange of educational information depends largely on the volume and types of information which can be identified and absorbed. One of the most vital functions of the educational planner is to analyse, compute and project information in order to allow the policy-maker to make a 'rational' or scientifically sound decision.

Such 'rationalization exercises' are only useful, however, if the problem is formulated in such a way that relevant information can be effectively absorbed and utilized in finding a solution. In the field of education (as in the other 'soft' sectors of the economy) we often lack a detailed understanding about the nature of the output of the educational enterprise. Or in other words, we have not always clear measures of accountability of the systems output because of the multiplicity of educational goals which are often expressed in normative terms.

The following questions were put to the symposium: Why make expensive efforts to increase the quantity and quality of information which goes into the educational process when we still have so little understanding about the mechanism of decision-making in education and in the absence of any tested pedagogical theory on the process of educational change? How much further can the planner help in educational reform beyond presenting the problems and the relevant available knowledge resulting from research and statistical computations in a more or less systematic form?

It seems questionable that the traditional context of educational planning i.e. the preparation of informed, scientific decision-making with its traditional instruments (e. g. cost-benefit analysis, manpower planning or social demand projections, simulation models, etc.) could be very helpful.

Maybe we should, in future, put more emphasis on the selection and analysis of information from different sectors of the economy required by educational planners who will need to become a type of social engineer. Eventually they should perhaps arrive at a unified approach to educational development planning by combining information from the *organizational process model* (reflecting bureaucratic and political structures in education), the *social relationship model* (reflecting the degree of 'participation'), and the *cultural model* reflecting value patterns and roles in a community) while preserving a number of relevant dimensions of the 'rational' *value-maximizing choice model* (reflecting economico-technological structures). It may be useful to pose some questions about the types of information required to feed these four models and which would be conducive to their integration.

THE ORGANIZATIONAL PROCESS MODEL

A planner, in order to attain the education reform objectives, might wish to take steps to mobilize traditional tribal, communal, religious and apprenticeship learning systems of the society he is working in. He will certainly encounter on his way a large number of decision-makers at all levels who see educational policy as the output of a complex, formal organization called 'The Ministry of Education'. Organization routines and traditions, the norms and values of organizational actors and rigid reward structures of the educational system may all be in conflict with an education reform which is mainly characterized by flexibility, participation and close co-operation between different government agencies, private firms, and other actors.

So, questions such as the following arise: How can we encourage the exchange of knowledge and information about the organizational process in education and ensure that it becomes an integral part of the educational planning discipline? What are the types of information and incentives required to stimulate organizational co-ordination between formal and non-formal education programmes?

THE SOCIAL RELATIONSHIP MODEL

We must recognize that, to date, the most important changes in education have been created largely by conflicts and crises between the educational system and its social environment. Conscious attempts to redirect education, e.g. reforms supported by research and development, opinion polls, etc., have often remained at the experimental stage covering relatively small population groups.

Planners who do not exploit the potentials of the normative, integrative aspects of interpersonal contacts, e.g. through group discussions with those who are most concerned with the basic education reform, miss out on an important dimension of the decision-making process, namely consensus through democratic participation. So, some further questions are: How can educational planners encourage a continuous flow of information between different interest groups in education? How can they utilize such information to increase the autonomy granted to individuals and groups and thus facilitate their adaptation to rapid social change and to planned educational reforms?

THE CULTURAL MODEL

While education is considered a fundamental human right, socio-economic forces may prevent the educational planner from actually designing adequate programmes which reach out to all population groups in society.

For example, an emphasis on 'creativity' in formal and non-formal educational programmes with a view to increasing the self-help capacity of those live in poverty may who conflict with the structured demands of those involved in production, who often prefer on-the-job training in order to mould a student's interest to coincide with labour-utilization interests. So where can the educational planner, faced with such a conflict situation, obtain a minimum knowledge of and information on value patterns, beliefs, ideas and rules in society in order to be able to mobilize those existing commitments supportive to educational change?

THE VALUE-MAXIMIZING CHOICE MODEL

Preserving (as well as stimulating) the most relevant techniques offered by this 'rational' model remains one of the important tasks of the educational planner faced with reform objectives. While recognizing the need for integrating the approaches of other models, the concept of rationality remains an essential dimension of planning theory. In their choice of methods within this planning theory, educational planners must, however, increasingly take account of the justified criticism of their performance. Such criticism usually focuses on three major shortcomings:

1. In view of the limited capacity of planning methodologies to measure properly all possible education outputs (like external effects) and in view of the scarce up-to-date information available in situations of rapid change, rational models will be of relatively little use. Policy-makers are more prone to decide on an acceptable alternative rather than to look for an optimum solution.
2. In the process of an educational reform, it is quite obvious that planning is necessarily mixed with policy and that planners will need to deal with the problem of implementation. This 'real world' can hardly be measured accurately and decisions based on easy-to-measure information while ignoring qualitative issues of critical importance risk rendering educational planning dysfunctional.
3. Any educational reform is likely to introduce the concept of conflict within the traditional system and its environment.

Still, the mandate of an educational planner to be a highly purposeful actor who, in the midst of constraints, is able to implement an educational reform, remains valid. One could even argue that, especially in educational reform situations, the responsibility of the planner to develop alternatives, delineating choice possibilities and estimating their potential consequences, weighs even more heavily than in situations of routine decision-making. Thus, some further questions are: What types of information and knowledge would be required by an educational planner who, in the complex situation of an educational reform, would have to advise policy-makers on a 'rational' choice? How can researchers, statisticians and teachers as well as parents be mobilized to produce such information in a form which the planner can absorb?

Hans Reiff

Mechanisms which could facilitate the dialogue between producers of educational development information and potential consumers

When Unesco's Member States, at the General Conference in Nairobi, 1976, decided that the Organization should put greater emphasis on the 'participation', 'endogenous' and 'poverty' dimensions of the development process, they indicated the need to study in detail the ways in which underprivileged population groups are affected by the decision-making process.

But in reality there is a growing tendency in both developed and developing countries towards centralization in educational decision-making as a bureaucratic fact.

Simultaneously, there is a growing rhetoric regarding decentralization in education as reflected in seminars, studies, pilot projects, etc. which attempt to involve a wide range of elements related to participatory planning.

This tendency towards centralization in educational decision-making is the result of a more and more sophisticated educational technology (radio, television, etc.) which increases the need for collective action.

The social science disciplines which provide the analytical tools for preparing educational decisions are also 'guilty'; they deal excessively with aggregate phenomena and the information collected for this purpose hardly facilitates individual decision-making. For example, the problem of matching the output of schools to future employment possibilities is based on graduate unemployment information available at the centre only; neither at school level nor at the level of the individual student is the information sufficiently disaggregated to allow for rational decentralized decisions.

The criticisms of this centralization tendency are well known: the centre cannot handle the flow of educational decisions as it is overloaded with information, and does not have time to use it.

In the absence of a theory of decentralization, one is often left with a trend towards centralization, reinforced by information streams that become more and more aggregated and that are presented in the form of macro-indicators; for example, consider the flourishing of the quality-of-life social indicator movement.

At the most, we can observe some instances of administrative decentralization, i.e. existing powers are being transferred to lower hierarchical levels within the same educational organizational set-up, but decisions are still controlled at the top through rules and regulations.

Political decentralization, i.e. the transfer of existing powers to another organization closer to the periphery (e.g. parents' organizations, community schools, etc.), is very rare, while recent national experiments seem not to have been successful.

Reports from a number of countries suggest that most educational bureaucracies are still based on a pure authority system in which information gathering is often used for the purpose of auditing individual decision-making. Also, an increase in sanctions and/or a reduction in potential rewards discourages any real educational innovations. A shift in emphasis away from collecting information on educational inputs (budget, etc.) in the direction of the construction of output indicators might be a safeguard against the tendency indicated above.

While in most socio-economic settings decision-making in education is probably easiest at the personal level, few governments take advantage of the individual's decision-making ability. They are thus forced to centralize decision-making and develop aggregate information streams to support such decisions. The importance of the potential role of the government as a catalysing agent in the generation and distribution of information is increasing as educational systems become more complex. For example, in most countries today, the existing labour-market information is too optimistic regarding opportunities for employment and salary scales; the rural student is more likely to hear of an urban success story than of the urban failure and he has the tendency of overestimating his own chances of success. Also, the labour-market information received by individual students often fails to articulate the difference in demand for graduates by quality and specialization. The cost of the 'wrong' educational decision (e.g. the choice of law studies, heavily subsidized by the government, which often leads to unemployment or underemployment) has often to be paid by the public taxpayer.

Consequently, less funds remain available for poverty-oriented educational programmes directed at underprivileged population groups. Countries need to develop an information and incentive mechanism which would help combat such social injustice.

In this connection, the questions to be researched regarding the relevance of information streams in national educational decision-making could be formulated as follows:

Given the fact that an increasing number of countries include popular participation among their educational policy objectives, and in view of the organizational reality that education is rarely politically decentralized, should these countries not focus more on exchanging information to better serve the mechanism of individual decision-making in education?

How do individuals respond to different forms of information? How does the total sum of micro-decisions based on more or less realistic expectations of individuals living in a real world affect the actual outcome of planned educational policies and what is the information gap in this context?

What types of information flows and policy incentives are needed in a country which wishes to ensure that the educational plan is not out of line with individual educational aspirations and expectations?

What is the information an individual has at his/her disposal about the actual pattern of positive/negative rewards in making an educational decision (e.g. which type of education is likely to lead to which type of employment and what level of salary)?

What types of mechanisms can we think of which would facilitate the flow of information among sectors, e.g. between post-primary education, the labour-market and the development plan?

Information, as any other factor of production, must be cost-effective. Many educational decisions are and should be made without full information because the marginal policy value of additional information which becomes increasingly difficult to obtain does not justify the sometimes extremely high cost of collecting it. For example, if one calculates the cost of manpower forecasts research and tries to impute the cost of misinterpretation and/or misuse of this information for educational policy-making purposes, it becomes clear that the whole education research/information process will have to become subject to accountability questions itself. So, another challenging question is how can we ensure that educational decision-makers and planners are careful in their assessment of research and information needs for the educational systems which they are managing?

Producers of statistics are important actors in all information and communication networks. While policy-makers in the field of education do not base their decisions on quantitative indicators and planning models alone, relevant and sound quantitative information can be helpful in the development of routine decisions in education.

However, present education statistics in most countries mainly reflect the traditional formal structure and functions of school education. The use of such data enables us to measure the inputs into the formal system but offers hardly any help in developing innovative programmes in education aiming at new outputs. Planning educational 'futures' will need information systems which go beyond statistics to meet routine operational needs.

Most objectives pursued by educational policy are not end-objectives but serve as inputs to wider societal objectives. In most developing countries, the highest level of decision-making in education lies largely outside the educational sector and institutions. It is often the Central Planning Office that translates the official goals relating to the economy into human resource requirements. Educational goals like 'democratization', 'equalization of opportunities', 'quality of life' and the like, which are often derived from the constitution and basic laws of the country, are rarely translated into operational sub-objectives. In most instances, the only goal area in which the Ministry of Education does any quantitative target-setting relates to enrolment targets which may be translated politically into 'satisfying the aggregate private demand for education'.

As a consequence of the above practice in most countries, both developed and developing, we find that educational programmes are mainly determined by social demand pressures, corrected at the upper secondary level by considerations of skilled manpower formation for economic growth.

As a consequence of these trends, statistics on the inputs into the formal school system (pupils, teachers, finance, etc.) and scholastic processes (flow and transition statistics, drop-outs and repetition, examination results, etc.) have been relatively well developed, while statistics required to construct educational performance or output indicators outside the purely demographic and occupation/manpower framework are not so easy to find. Therefore, additional valid questions to ask would be: How can governments develop an information and incentive system which would facilitate gradual change in the direction of educational programmes to respond to objectives outside the purely 'economic growth' and 'demand-for-places' oriented goal structure? What are the constraints countries face in developing quantitative information systems relating to non-formal and informal educational activities? To what extent is quantitative information which is collected outside the educational sector (census, household surveys, etc.) being used in educational decision-making? What incentives have countries (successfully) developed to integrate a wide variety of relevant qualitative and quantitative indicators into the process of educational planning and policy-making?

There has been significant progress in the production of high-quality research results in social and pedagogical sciences which could assist the educational development planner to programme the allocation of the country's available resources more effectively. Neither the quality nor the quantity of research is in question here; what we would like to know are the ways in which research results reach policy-making bodies and the factors which cause some research results to be used and others not.

The OECD Development Centre has undertaken a study[1] on these questions as related to social and economic development research in general but some of its findings may well be relevant to the research links within the education sector. The major conclusions of the study were that:

1. Concern about dissemination of research results is a fairly new consideration among researchers.
2. An almost complete lack of knowledge exists about ways in which research results reach policy-making audiences and the rare instances in which the research and policy needs of the latter groups are being translated into new effective methods of dissemination.
3. Until specific audiences within the developing countries are identified and the information needs of each are ascertained, efforts at effective dissemination will continue to be governed by the researchers and funding agencies; they will not be a reflection of the identifiable information and policy needs of the utilizers in the developing countries.

In the field of education, we should try to obtain empirical data to determine how information is received and circulated to and among participants in the very wide range of policy-making units and measure their different information capabilities, i.e. information needs, time constraints, attitudes towards research, use of different channels by which research can be obtained.

Since an organized, institutionalized system for disseminating educational information exists in only a few countries, educational research is often sponsored within the government because it tends to be more politically compatible; there is some evidence that 'independent' research is used by educational decision-makers only if it is compatible with their political priorities or if it can demonstrate the 'objectivity/neutrality' of an educational decision already taken. In this connection, timing is an important problem: research is not always available when educational policy-makers are 'forced' to make decisions.

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[1] Robert M. Batscha, *Dissemination of Economic and Social Development Research: Report on a Four Year Multinational Research Programme.*

Some of the OECD findings suggest that formal channels for dissemination (libraries, scientific journals, meetings and conventions, reference and abstracting services, etc.) were found to be rather ineffective in catching the attention of policy-makers while non-specialized publications (newspapers, weekly news magazines, etc.) which publicize abstracts of academic reports were more often absorbed.[1]

Therefore, we need answers to the following questions:

How do statistics and research results actually reach educational policy-making audiences and what are regarded as effective methods of dissemination?

How can one develop guidelines concerning the advantage and disadvantage of different methods for disseminating information for educational policy-making and planning (e.g. meetings, abstracts, newsletters, etc.) and how can we assess costs as against the degree of absorption by the audience aimed at?

How is research information received and circulated to and among various policy-making units in formal and non-formal education and what can we say about their respective absorption capabilities for research results?

What are the modalities by which the mixture of information and financial/technical assistance resources communicated by donors and international agencies is absorbed by the different governmental and non-governmental agencies involved in educational decision-making in developing countries?

How do these latter agencies in recipient countries integrate these information/aid flows into the moral/ethical power structure which determines the decision-making process in education?

The role of the international community regarding information networking[2]

The relatively recent mushrooming of information networks as one form of international co-operation in education is often justified by the affirmation that information exchange is value-free and therefore to be preferred to sending experts and consultants to the Third World, which often results in frequent accusations of cultural imperialism. However this is not necessarily the case. No information is completely impartial; the mere choice of selecting one type of knowledge to enter the networking system and not another is by definition biased by the value system of the network operators.

The ultimate goal of an educational network would be to exchange knowledge across professional as well as geographical borders (e.g. stimulate the dialogue between curriculum planners and the labour-market analysts) in order to aim at a global approach to educational development planning.

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1. For a deeper evaluation of this issue, see Chapter 15, below.
2. See also *Knowledge Networks for Educational Planning: Strategies for the Better Use of University Resources*, University of California, July 1976.

In order to attain this goal, any international network in educational policy and planning should gradually move away from transmitting only conventional knowledge, based on statistical data applied to fairly well-defined problems in well-established institutional settings. Such types of knowledge have little chance of changing educational policy-making and programme development in the direction of the rural poor and other underprivileged groups in society.

Any new networking attempt in education is justified only if it can eventually attain the following long-term objectives: (a) focus on the identification of client needs, and, as much as possible, involve the participation of clients in the network's design process; (b) keep a balance between top-down knowledge delivery systems and bottom-up information streams generated by primary target groups; (c) link the producers and consumers of knowledge with explicit attention to reaching down to the most undeprivileged primary groups, representing the ultimate target of democratic educational policies.

In a top-to-bottom education networking strategy, it would be very difficult to assure the transmission of information which reflects all the micro-linkages between education and other socio-economic sectors of the local economy as well as the interdependence between human resources across geographical regions in a country. There is a need for first-hand contact with the 'educational reality' which primary target groups experience in their own daily lives. It is mainly at this very down-to-earth level that the interaction between education and its socio-economic environment becomes visible. This calls for a more subjective (less academic) knowledge base and a less institutionalized way of formulating educational problems and identifying information useful in their solution.

A basic question here is: Is it realistic to expect an international agency, bound by a complex set of bureaucratic and political rules, to perform the role of a catalyst in user-oriented educational networking? If the answer is positive, then what criteria should guide the selection of instruments for performing this role?

In order to attain the broad goals indicated above, the following modalities for the functioning of international networks in educational policy and planning may be considered:

Integrate the pragmatic and almost anecdotal lessons of real social practice with those of academic expertise gained by scholars.

Mobilize the information produced by practitioners in educational development projects who are the main knowledge generators and whose solutions to problems in educational policy planning and management are often underrated and overshadowed by the (written) results of academic research.

Facilitate the exchange of those types of information which would encourage communities, local institutions, etc., to help themselves (e. g. community educational voucher programmes, community school construction, etc.).

Establish equal partnership in information networking. As educational planning by itself is unlikely to change the political, economic and social structures affecting relative social status and poverty situations among different population groups, an improved knowledge base in educational planning is not likely to change this status quo either. Therefore information networking for self-reliance in education would have to reflect the preferences of a society as a whole, the educational wishes of population groups which themselves do not belong to the élites and have been victims of inequality in education.

In theory, information on educational policy, planning and administration could be exchanged through four categories of action:

Diffusion among groups and individuals in the same 'business' (e.g. educational planners, economists, school architects).

Exchange among those who do not share similar roles and for whom knowledge must thus be translated across professional, cultural, political and other barriers.

Application, i.e. action resulting in outcomes perceived by primary target population groups: children, parents, social action groups in the community, etc.

Evaluation of knowledge exchange outcomes; a capacity to learn from experiences (memory) and to modify actions on that basis.

However, an international network in educational policy and planning cannot possibly perform all these functions; it must focus and be selective. In this connection, two focal points of action could be most appropriate: (a) bridge the geographical and cultural distances that span the production and utilization of knowledge in educational policy, planning, administration and facilities with a major emphasis on the needs of its users; and (b) bridge the conceptual distances and reconcile the distinctive perceptions which people from different disciplines (educators, economists, politicians, etc.) perceive in analysing educational development problems.

The role of Unesco in the diffusion and utilization of educational information

In the first place, it is far from easy to identify diffusion gaps since almost every individual, either working in a government, the United Nations system or in a university has been running some type of private networking system.

'Networking', as one colleague expressed it, 'is the logical complement of any serious professional job.' The existing number of educational networks of different sizes and with different objectives is impressive. (See Chapter 18 where the Secretariat of Unesco has attempted to make a preliminary listing of such networks.) In view of the risk of overlapping and duplication, the need for identifying the 'international gap' is very important and the initial task may therefore have to centre around the need for selectivity.

Emphasis should be on building on what exists. An effort should thus be made to evaluate long-established practices in educational networks developed along similar lines and with comparable objectives. There is a need for establishing a historical memory in the area.

The inventory referred to above would, at first sight, suggest two major imbalances. First, most operational networks are based in developed countries.

In an attempt to move away from this 'dependency of ignorance' there should probably be more Less-Developed Countries (LDC) information networks (or sub-networks) based in Less-Developed Countries (LDCs) so that 'new' knowledge can be developed in a geographical and cultural context where knowledge is destined to be applied and validated. Second, the networks, whether they be pure information networks (for example IERS/IBE)[1] or research networks (e.g. IIEP, ECIEL,[2] Berkeley[3]) are mainly organized around the concept of knowledge supply' with a build-down (decentralization) towards the users. Some regional networks (e.g. APEID)[4] have only just started to become 'innovation-knowledge-brokers', gradually focusing on identifying and mobilizing the knowledge users.

The instruments to be selected in any complementary international network should therefore work primarily towards the recognition of users' needs, facilitating access and mobilization of a variety of undeveloped knowledge sources, motivating primary target groups to define their own problems and utilizing great amounts of 'unrecognized' knowledge for solving them.

Improved and more efficient networking in educational policy, planning and administration within an organizational framework like Unesco cannot ignore the already existing mechanisms for educational knowledge transfer sponsored by the Organization.

Unesco operates at present four institutionalized patterns of exchange of information related in a more or less explicit form to the fields of educational policies and planning, with the following major characteristics.

IIEP—educational planning research and dissemination, mainly through international training courses, publications, seminar reports and a newsletter.

IBE/IERS—leadership and international co-ordination of a documentation network in education with a focus on educational innovations.

Unesco Regional Offices of Education—training of educational planners at regional and national level (correspondence-course material), surveys and inventories of educational developments in the region (bulletins), technical meetings (reports) and regional educational innovation networking (newsletters).

The Unesco Secretariat in Paris—regional and international ministerial conferences on educational development; advisory services to Member States sometimes connected with project or programme development for external financing (reports); technical meetings on specific problem areas in educational development as encountered by government officials; the series 'Reports and Studies in Educational Policy and Planning' intended to

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1. IERS/IBE: International Education Reporting Service; International Bureau of Education.
2. ECIEL: Programa de Estudios Conjuntos sobre Integracion Latino Americana.
3. Berkeley: short for International Resource Panel on Educational Finance, Cost and Efficiency, a network (now extinct) formerly operated by the Program in International Education Finance, School of Education, University of California, Berkeley. See also Chapter 15, below.
4. APEID: Asian Programme of Educational Innovation for Development.

ensure wider dissemination of technical material to field experts, government officials, researchers and donor agencies.

Given the above pattern, an identification of the gaps in information dissemination in educational policy and planning might point in the direction of the link between educational policies and international co-operation.

In this connection, Unesco could possibly exploit further its potentially 'advantageous' information situation at the crossroads of international relationships in educational development. The first-hand knowledge gathered from close contacts with governments, donors, research agencies, other United Nations Specialized Agencies and, last but not least, motivated personnel of educational development projects could thus be translated into educational information streams that may gradually become truly interdisciplinary, cross-cultural and policy-relevant.

In view of the growing suspicion in recipient countries that funding agencies, with their powerful leverage, greatly influence the diffusion of research and information related to educational policy questions and in view of the prejudices of educational policy-makers in many developing countries against research which is 'donor-biased', there is an obvious need for counterbalancing this tendency.

Given the complexity and hierarchy of national and international policy-making and research structures in education, it will not be easy for any one organizational unit to act as a catalyst for disseminating the 'real needs' of educational development as felt by the system's clients to the relatively powerful donor institutions and to assist educational decision-makers at all levels to articulate their research and information needs in their dialogues with information specialists and researchers who have their own priorities.

The problem of choice to focus the network on a number of relatively specific subject areas needs to be solved. At this stage, the subject areas as identified by a number of meetings with governments at ministerial and working levels which Unesco has sponsored over the last few years[1] would suggest the following list of topics from which a choice could be made: educational policies for the future; education, work and the international distribution of labour; the new international socio-economic order and innovative modalities for international co-operation in education; the planning of integrated formal, non-formal and informal education.

A final question in this connection is: What sort of mechanisms can an international organization like Unesco develop to ensure that specific information on the above (and other) issues which is being received from all levels of disciplines involved in educational decision-making for the future reaches the largest population groups most in need of such information?

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1. For example: Conference of Ministers of Education of African Member States; Lagos, 1976; International Conference on Education, Geneva, 1977; Meeting of Senior Officials of the Ministries of Education of the 25 Least Developed Countries, Paris, 1975; Symposium on Educational Planning, Human Resources and Employment, Paris, 1976.

15 Organizing an international information network in education

Roger Pritchard[1]

Introduction

In this chapter we shall delineate the process and problems of setting up a network in educational policy and planning. To do so, and to highlight the innovative features of our approach, we shall first survey the general context in which a network has to operate and then present properties that we believe important or essential if the network is to have impact and be successful.

Networking is a process of moving information whose time has come. There are several reasons for this, all well known, of which we can mention three. First, the division of labour has created a great degree of isolation among specialists. Whatever the individual country or region, field or topic, mechanisms that distribute information among those specialists are a necessity. Second, in the international context, geographical isolation, in addition to division of labour, between one expert and another (what one of our network members has called 'the loneliness of the far-distant runner') creates an additional reason for an effective distribution mechanism. Third, and cross-cutting these two reasons, is the fact that, when information does flow, it can flow inconsistently—not arrive where needed— yet in such profusion when it does flow that the reader is drowned in a sea of paper and rhetoric, unfocused and often misleading. In many fields now, publications have been developed to cover and condense the wide range of material available. A successful network has to connect isolated experts, offer a reliable flow of solid information that really can be used and thereby create and maintain a community of active participants.

Network development in the education field up to the present time has essentially been development of end-result systems. End-results are the publications, papers, proceedings, findings, etc. of projects, programmes, experiments, etc. These end-result systems are almost always library-based. Relatively recent innovations include development of computer-based annotated storage/retrieval systems, extension to unpublished as well as published work, elimination of duplication of holdings in a group of libraries, etc. The library remains the main repository of information and users send their requests, via various media, to the point of storage and retrieve what is stored under the terms described. For example, the International Bureau of Education runs an International Educational Reporting Service (IERS) to supply information on educational innovations at a cost of $600,000 per annum. Its service are: a bimonthly newsletter alternating with a bimonthly computer-based bibliography, a series of occasional short monographs and an answer service for specific requests.

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[1] The author wishes to thank Professor Guy Benveniste of the University of California, Berkeley, for his seminal contributions to the development of our networking approach, and to thank him and Professor Isabel Pritchard of the University of Texas, Austin, for constructive critiques of the first draft of this chapter.

Prior to the end-result publication stage of research, implementation, training, etc. there exists a whole series of stages—from conception to pre-publication completion. Information about these various stages is rarely, if ever, disseminated: if it is disseminated, it is often merely in the form of announcements.

To create a community among relatively isolated experts around the world, it is essential to set end-result dissemination to one side, de-emphasize the creation of a repository, and focus on circulating information about the pre-publication stages we have mentioned. The circulated information must be straightforward and freely available. A newsletter run by a small secretariat is the best medium for this purpose. We have developed a simple model in a limited area of educational policy and planning for networking information in this fashion. It can, we suggest, form an innovative centre for a more far-reaching operation.

In order to be successful, however, a networking system will have to develop all or most of the properties we are going to describe. If this is not done, the quality of the networking operation will suffer in varying degrees and network members around the world will not be properly served. If, however, this *is* done, our experience shows that the approach is highly cost-effective in comparison with end-result systems.

Our own network,[1] reaching at a minimum 1,000 persons, costs about $20,000 per annum to run.[2] It can be run in association with the traditional end-result network service (as we do as part of our $20,000 per annum budget), or separately if the latter service is being offered independently. It is also highly flexible and can be developed in several directions, some of which we shall deal with later in this chapter.

As far as we know, this is the first presentation of this type of analysis of network context, properties and strategies for maximizing effectiveness. At any rate, usable published literature has not come to our attention in the field of education. Therefore, it seems that we are dealing with an innovatory approach to networking whose time has come. Those who develop this approach will be in the vanguard.

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[1] Shortly after this chapter was written, the network described by the author was discontinued.

[2] This figure does not include the cost of books purchased or the salary of the librarian for other related duties. If these are included, the budget is raised to about $30,000.

Network context and network properties

NETWORK CONTEXT

International versus national

Examination of national patterns of information flow reveals wide divergences. National political systems, the organization of school and university systems in the political contexts, the role of central and decentralized bureaucracies in the running of public and private educational systems, and the interaction of research, training and decision-making processes are some of the institutional variables to consider. The size, population and stage of development of each country also have autonomous roles to play.

In this chapter, we confine ourselves to the international flow of information in educational policy and planning by means of networking. It is, we have found, possible to set up an international network that has an interface with national systems but does not depend on them in a problematic way that demands country-by-country analysis. The idea of creating and maintaining a network for a community of relatively isolated experts requires only that they be able to be active in the network; it makes no particular demands about their institutional setting and political background, except to ensure world-wide coverage and inclusion of various types of institutions.

Potential membership

Who needs the network and who will contribute to it? The relatively isolated specialists—researchers, trainers and teachers, policy-makers and decision-implementers—in the Member States of Unesco do have channels of information now. Journals, reports, conferences, organized and distributed by various institutions—governments, universities, private foundations, international and regional organizations—provide this service. But the channels are incomplete and in any case provide no systematic contemporaneous mechanism through which to express a community of interest. This is true whatever the stage of development or whatever the political system of a particular country.

Apart from this, the body of knowledge and beliefs in the field changes rather rapidly, in technical, strategic and political respects. Educational systems and institutions themselves are subject to sudden and deep changes and to moves made in the arena of international power politics. Furthermore, talented individuals are in great demand and can undergo rapid promotion and movement into and out of national and international planning and research institutions, changing field if necessary. We have experienced a turnover in our network of about 12 per cent per annum for all these reasons, although there is a constant core.[1] For such reasons, a network exhibiting continuity, regularity, dependability and, of course, circulating good quality material, is peculiarly appropriate.

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[1] Figures used in this chapter about our network's characteristics and effectiveness are based on the first 40 per cent of returns of a questionnaire sent in March 1977 to all our members. A full analysis of the 50 per cent finally returned was available in August 1977.

Potential members who need and can contribute to the network information flow are, of course, in general terms, those engaged in research (theoretical and practical), training and implementation at policy, planning and project levels, in the field of knowledge/beliefs covered by the network. What this means in terms of individual countries varies greatly, depending on the political and bureaucratic conditions, development stage, size and other variables mentioned above. The point for the international network specialist to grasp and implement is that there is no prescription about how to identify individuals and institutions *a priori*; identification must be grounded in the realities of individual countries. However, the individuals or institutions involved must be active in the field for the duration of their membership and make way for others when they cease their activity. This is, of course, a problematic matter and will be discussed at greater length below.

Boundaries

What are the processes of producing usable information in a particular field? What in those processes should the network pick up and distribute? What shall the content or field be, in any case?

Irrespective of the content or field, a series of processes takes place which a network has to address. That is, new ideas are thought out, new knowledge produced, new approaches suggested; older ideas, knowledge and approaches are remembered, recalled, found more appropriate. Ideas, knowledge and approaches come not only in the stereotyped pattern of fallout from research but also from implementers, planners, people on the interface of, in our case, teaching, who engage in the actual activity and hopefully still have some say about it—not just traditional 'teachers' but 'students'. From whatever sources they come, ideas, knowledge and approaches are tried out and disseminated, evaluated, put into more general use, found wanting, retired from service.

This whole complicated multi-dimensional and multi-directional set of processes tends to be shaped in the modern world around research activity and implementation activities. A network has to recognize this, while at the same time being open to all sources without discrimination. Such openness is particularly necessary because of the proven tendency of universities in particular to be overinterested in theory and of bureaucracies to be out of touch with grassroots needs. Further, since recognition has to be given to the great variation in member countries and their needs and ability to contribute, a single modern research-implementation model is far too narrow. In an international network, a broad-banded conception of the processes going on and the appropriate boundaries is necessary.

Picking up elements of this process for transmission in the network is not as complicated as this description may make it appear. For there are 'cutting points' at which formalization takes place and transmission can occur. I refer to such formalities as proposals, plans, reports (interim, annual or final), other documentation, reviews and evaluations.

In the traditional form, there can be a time-lag of five to ten years between first proposal and final publication of end results of the experience, as a book, article or other formal presentation. Presentation at a conference often cuts the time-lag down but is shared only by those with access to the proceedings. The major purpose of our proposed network must be to capture and transmit information at the earlier cutting points, including the proposal stage. This is the best way to resolve the tension between traditional research–planning–publication lags and the needs of relatively isolated individuals and institutions in a fast-changing situation, where so many resources can be saved and so much greater effectiveness be achieved by sharing information at an early stage. Thus, we propose not only to move back in time from sharing formal publication (books, articles) to sharing less-formal publication (reports, papers, documentation) as does IBE's IERS, but to continue back through the other stages, even to the stage of formation and first stages of ideas, projects and approaches, at which co-operation, feedback and support can also take place.

We are suggesting, in a word, that an information network perform a news function for members, spreading information that it is important for various reasons for members to know about, at the time they need to know about it—no later. Such an orientation quickly suggests a format.

The focus is a newletter and coverage is given, at a minimum, to: important activities in research, implementation and training at all stages of the process; controversies in the field about approaches, ideas, methods, technology, politics, etc., with a view to throwing light on them by airing them; occasions, such as informal publication or conferences, at which early dissemination takes place; and possibly end-results in the form of publications, etc.

In addition, and because of the different situations in which members find themselves, the network can perform an assistance function, at the level of information or personal support. This will be discussed at greater length subsequently.

As far as network content is concerned, it is, of course, relatively independent of the networking needs derived from general processes going on around the world, which are comparable in most fields of endeavour. The focus of this publication is on educational policy and planning. Where this is problematic is at the margin, where decisions have to be made on what to include and what to exclude. Such decisions are also dependent on the amount of funding available for networking, which may limit coverage, as well as on the internal bureaucratic divisions of the networking institution. Our own network is relatively narrow in focus: by concentrating on finance, cost and efficiency-effectiveness issues without arbitrarily excluding others, it limits range and focuses on more technical and non-ideological issues. A networking effort over the broad range will have to be seriously thought out from the points of view of coverage, size of network, subdivisions and related complicating variables.

MAJOR NETWORK PROPERTIES

People base versus information base

We have already contrasted end-result and work-in-process networks as if they were information-based. There is, however, a prior issue: shall the system be people-based or information-based? Simply put, the first system moves the people who have or need knowledge, while the second moves the information itself.

There are several examples of people-based, or at least people-focused networks in our field. In one perspective, teaching itself can be seen as a knowledge-networking activity, usually directed from teacher to students but also capable of being exchanged among a relatively equal membership. Thus, the work of IIEP, which focuses on training, with research, backed up by various forms of documentation, including an IIEP-centred newsletter, represents a network of this type. More clearly networking activities based on people are those of the technical expert, the consultant, the joint project or technical co-operation, in which knowledge is spread—usually from one side on a technical basis and from the other side on the basis of knowledge of local conditions— mainly by personal contacts and assistance, with documentary back-up. The APEID network operating out of Unesco's Regional Office for Education in Asia is a good example of this, being particularly sensitive to considerations we shall examine throughout this chapter. The International Management Training for Educational Change (IMTEC) network operating out of Oslo, Norway, is another example well worth looking at. Conferences, seminars and other relatively formal gatherings also represent a type of knowledge networking, in which people with something new to say can present it personally to a gathering or audience for critical examination and discussion.

Since it is much more expensive to move people than information, cost considerations really militate against a people-based network which has comprehensive spread and general availability. The activities of IIEP, in face of the world-wide demand, are constrained to a very great extent indeed. The activities of technical missions, experts, etc. are important on occasion, but similarly constrained. Conferences are helpful but expensive too. Although training, consultation and conferences have a place, budgetary restrictions and considerations of cost-effectiveness are very likely to demand an information-based network, in which the information, rather than the people, is moved to the place it is needed.

Such a network is appropriate, under present historical circumstances, for additional reasons. Many countries have reached or are reaching a position in which they have experts who can hold their own with experts from other countries. Their need, therefore, is for information about new developments rather than for direct assistance. Unesco membership reflects great variation in this respect, but an information network available to all members needs to recognize this fact, unless a policy decision is made to divide membership on the basis of such differences. We have found it unnecessary to do so. However, as we shall suggest later, there is a place for various secondary person-based network activities, particularly in the form of consultation services.

In the limited writing on networking, we have found it frequently asserted that the people-based networking activities are the only worth-while ones. There are two main lines of argument put forward. The first is that communication only works, or works best, when it is direct, especially face-to-face: these are the conditions under which interchange of ideas can really take place. The second is that information-based systems do not work because people do not read what they do not solicit: they are overwhelmed with information and find it difficult or impossible to wade through it.

Clearly, if the relatively low cost of an information-based network is to be made effective, it must be given as many properties associated with interpersonal relationships as possible. In particular, it should be made to connect individuals rather than institutions, and it should be informal and decentralized. It should offer status, colleagueship, a sensitive secretariat that provides personal support and encouragement, as well as ease of contact and valuable information. We shall discuss these properties next.

Let us anticipate, however, some of the details of the next main section of this paper by briefly indicating how we have met the objections raised against information-based networks. Two specific strategies can be mentioned, based on the properties set out above. First, to get people to pay attention to what they do not solicit, we have adopted the panel model for networking. That is, rather than sending out information somewhat blindly to any and all people whose names we come across, we deliberately restrict our networking activities, at the chosen level, to a specially invited panel of experts, all of whom must be active in the field. The simple fact that as many as one-half of our membership voluntarily contributed to our evaluation questionnaire and were unanimously in favour of the network is testimony to its impact: such a return rate is exceptionally high and such unambiguous support is unusual.

Our second strategy is to make it as easy as possible for members to get in direct contact with each other, thereby avoiding the constraints of centralization. Specifically, we insist on sending with each newsletter a current, updated list of members with their addresses and we give with every piece of information in the newsletter the source from which further information can be obtained. Our evaluation gives evidence of extensive further contact between members. Not only does each member regularly read the newsletter, but almost three-fifths have made independent contact with one or more other members after reading an item in one of our first six newsletters and over half of these have continued with further contacts. Without knowledge of the whereabouts of members, such crucial decentralized network contacts cannot take place.

Informality versus formality

The present system of research/implementation and publication stands as the current formal one for spreading information. Conferences provide formality too. Less formal are papers, reports, seminars, symposia and some newsletters.

Potential members are used to the formalities and there are routine ways of preparing for them and standard ways of distributing them. Libraries are then repositories; books, articles, papers, proceedings, etc. are the main media. Universities, policy-based institutions and governments have developed formal systems for their collection and dissemination.

Connected with the issue of the time-lag between initiation and publication of an activity, mentioned earlier, which demands a service in terms of a news-oriented information medium, is the issue of the degree of formality such a medium should take on. If our claim for the necessity of giving the networking activity the properties of interpersonal relationships is accepted, it follows that the approach should be as informal as possible under the circumstances.

Informality must be accommodated to clarity. The sheer quantity and rhetoric found in publications and conferences, as already mentioned, plus the associated rituals, cause the hard-pressed worker, in whatever capacity, to long for an informal, honest and straightforward flow of information about what is going on in the field.

Network morale always remains an issue for people who hardly know each other. This is one of several reasons for making personal contact a supporting part of the network, as we indicate later.

Individuals versus institutions

For the reasons given above, it is much better to construct a network of individuals than one of institutions. The latter type of network is appropriate for communicating information of the formal system, such as library accessions lists, computer-based information systems, conference proceedings, etc. But, for the reasons set out, such formal networks simply do not have the power and immediacy of personal networks in which formalities are cut through and information is shared as news by people who can both contribute and respond.

If it is not possible to construct an individual basis for membership, it is essential that institutional members nominate an individual active in the field to co-ordinate information flow from the institution to the network and to spread to relevant individuals in the institution information from the network. In our network, which is entirely inter-individual (although members can always send materials received to their library), we have found that about two-fifths do not share their newsletters with anyone but that the readership for the three-fifths who pass their copy around to colleagues, etc. is about 5.75 persons per copy per issue—extremely high for such a publication. In our core network of 200 persons, then, there is a known readership of some 800 persons, prior to any library availability. Some of our members, therefore, are in fact acting as co-ordinators in their institutions, usually on an informal basis. Such co-ordination, in turn, means greatly reduced costs for the network in printing, in distribution and in the effort to seek out information from a network of effectively quadruple size.

Centralization versus decentralization

When a network receives and distributes information, while making it difficult or impossible for those sending and receiving the information to communicate with each other, it necessarily centralizes the networking system. We do not recommend such a system. Apart from gratuitously increasing the power of central bureaucrats through control of the information, such centralization increases formalization and counteracts the interpersonal thrust. In effect, the network achieved is one of a wheel with spokes and no rim rather than a true one whose connections are made across the web as well as through the centre. The former system is appropriate when a newsletter is basically giving information about the issuing institution, as does IIEP's *Bulletin*. But, in a network such as ours, every member is offering information to every other potentially interested member. In a context in which the essential purpose is to maximize the free flow of information among the membership, every means available must be used. Independent contacts between members are an essential element. Network morale depends on an information flow encouraged, put out and shared in a collective enterprise, just as it does in face-to-face contacts between colleagues. Such a collective enterprise, being unusual or absent in the normal formal publication system, is something that has to be continually cherished and buttressed. Since members are not used to the idea of sharing current information as news routinely and informally through a paper network, everything must be done to show them that it is worth their time and effort to do so. Thus, the organizing institution should be more secretariat than editorial board, more a booster of morale than severe judge of contributions made, and certainly more a facilitator than a repository of information. If the network members are pre-screened, problems of quality do not loom too large.

Process and problems of setting up a network

Let us now present an analytic description of the process and problems of setting up an international network. To do this, we shall draw on our experiences in setting up and running such a network, based in the School of Education at the University of California, Berkeley, and funded by the United States Agency for International Development (USAID), in the field of educational costs, finance, efficiency and planning. Our network offers a simple model, both overall and with respect to its main innovatory features, mainly because of budgetary restrictions. With a larger budget available, a much broader range of services could usefully be built up. Organizationally, we see these as subsidiary services that may already be in existence or that could be performed by other divisions of the networking institution.

We offer a newsletter, focused on work in progress, which is shared by a core group of some 200 experts in the field, and a library accessions list/bibliographic service distributed to a larger group of some 300 interested individuals and institutions; we also distribute our programme's publications and receive and work with visiting experts. The budget devoted to the first two activities (some \$20,000 to \$30,000 per annum)[1] represents about 10–15 per cent of our total programme budget.

Our experiences can be generalized in terms of issues and problems that any network organizer can expect to encounter, and we can suggest strategies for attaining success. The first part of this chapter has already delineated the properties needed to maximize the quality of membership, information and secretariat. Members must be found and motivated to contribte information; the information must be of high quality; the secretariat must circulate information in a reliable, timely, clear and attractively presented fashion, thereby demonstrating to the relatively isolated network members that a really useful service is being performed that can lead to new linkages between members on the basis of common interests and projects.

We propose to review in more detail issues to be considered and problems often encountered in recruiting members, developing coverage, determining media and transmission and co-ordinating the network and maintaining network morale. Our focus is upon the particular, innovative service we offer, namely the newsletter service. But, we believe, considerations that apply to it also apply to other possible services, including traditional ones. For example, our librarian now regularly includes in the library accessions list a companion list of names and addresses of the publishers of every accession received. Here, again, is a simple and inexpensive device for putting interested members of our broader network in direct contact with the source of information. More generally, attention to network properties, strategies, tactics, issues and problems presented here will be highly suggestive for a more complex effort.

RECRUITING MEMBERS

By adopting the panel method of recruitment described earlier certain conditions are set up that will enhance success. The invitation to a panel of experts, especially when offered by an independently prestigious institution, confers a status on the membership that no general circulation centralized network can confer. Such an invitation provides a mechanism, beyond the mere need to share information, for involving good contributors on a regular basis. The need to receive information is usually felt more strongly than the need to send it out. The inertia in this respect has to be overcome by as many incentives as possible.

One other possible incentive is an honorarium for some or all items submitted that are included in a newsletter or otherwise used. Such a financial incentive for our international network was rejected by us for budgetary and administrative reasons, but it is a viable option if the secretariat's institution is able to organize it. In the absence of financial incentive, status and the basic need to share information informally about work and projects in progress must form the underpinning of network activities. We have found that these are sufficient.

If a panel method of recruitment is adopted, the issue of invitation procedures is a delicate one. Who shall be and who shall not be invited? Once the field of content coverage of the network is defined, the task is relatively easy. In our case, we began by inviting all individuals to our network who had a known capacity and were currently working in the field. In a standard letter of introduction, we explained our affiliation, our purposes in networking and offered an invitation, a request for a curriculum vitae, and a request for the submission of further names for consideration. Once beyond the circle of well-known persons, we modified the letter to indicate that the person's name had been suggested and that we would like to invite that person provided that he or she was currently working in the field.

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[1] See footnote on page 188.

In order to develop the broad-banded network envisaged, we wanted (a) to make room for both the well-known people and the newer entrants in the field, (b) to maintain a balance between universities, governments, international/regional organizations and private foundations, and (c) to achieve as broad a geographical spread as possible, given such constraints as the national location of the secretariat (United States) and the source of funding (USAID). These goals started to direct and eventually dictate choices about individuals to invite. A further constraint was an upper limit of some 200 persons, for reasons of budget and maintenance of membership status. It became, on occasion, necessary to follow up an initial invitation with a further special invitation, either to those well-known, those in key positions or those in countries with no representation or poor representation.[1]

The difficulties encountered in such an approach are relatively few, provided that the secretariat makes it its business to get to know the international map of educational policy and planning endeavours and the important individuals in the field. Some individuals will suggest names of their personal friends and their colleagues. To counteract this, as well as for budget reasons, it is important to insist and explain that almost no institution needs more than one or two individuals to represent it and act as co-ordinator(s). The important strategic issue is to ensure that only *active* individuals are included by making it very clear that only such individuals should be nominated.

It does occur, however, that inappropriate individuals may nevertheless become members. To deal both with this problem and the separate issue of relatively rapid movement into and out of activity in the field, we developed the following approach. In so far as a member is inactive over a year (or other defined period) in every way, or even through failure to contribute to the newsletter, we send a letter pointing out that the basis of membership is active contribution, inquiring whether the person is still active, and saying that the person will not be continued after a certain date unless he or she contacts us, hopefully with a contribution. So, apart from the initial screening mechanism, which does fail from time to time, and because of the turnover of membership, a second-stage screening mechanism is necessary. As a consequence of this, continuous recruitment is necessary, both of individuals in new institutions and countries as they are discovered or develop capacities in the field, and to replace lapsed members. Whereas others may measure success by expansion of the network, we measure it by the quality of its interchange. To maximize this, our sources of information must be active and good, and motivated to contribute; for this, continuous recruitment is necessary. There does exist, however, a reliable core of members with a longer-term involvement in the field. Apart from a 24 per cent turnover in two years, our remaining members have been in their current affiliation on average for about six years (including some long-serving academics).

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[1] At the time of writing, there were 207 members in about sixty countries and about fifteen national and regional organizations.

A set of related problems derives from the political image of the sponsoring institution of the network. In the case of our own network, a university base is, as such, an asset. But we have found that our unilateral sponsorhip has caused us to fail to recruit, or recruit incompletely, members from particular countries or with certain political viewpoints, mainly because they do not wish any association on principle. It is political imagery which is at work here, because our sponsoring institutions have left us scrupulously alone to pursue an editorial policy of our choice.

The best policy, for this and other reasons already mentioned, for any organization is to maximize the flow of information, debate and controversy through the available media. In setting up a network with an information function, one must be seen, as much as possible, by potential and actual members to have no particular political biases and no interest, either, in controlling the flow of that information, for bureaucratic or other reasons. Thus, available and submitted information determines, to the greatest extent possible, what is circulated in the newsletter; and thereby flow is maximized.

DEVELOPING COVERAGE

Our own newsletter, linking some 200 individuals in a relatively limited field in education, has experienced a steady flow of valuable information. Eight newsletters of about sixteen pages each and published on a quarterly basis, have, apart from other types of information, presented over 120 projects and programmes in the field at various stages of their development.

Although the majority of contributions have been made on the sole initiative of the person submitting the information, under certain circumstance we have solicited information. The main occasions for doing so are: (a) when it is important to encourage the less self-confident who are doing good work; (b) when busy and influential people in the field, who in many ways do not need the network because they are in positions where they have all they need, are encouraged to contribute; and (c) when there are issues that tend to be neglected and individuals working on the issues need to be solicited to send in information or present a point of view for debate. Generally speaking, however, those engaged in projects find it relatively easy to send in summary information on work in progress.

The focus on work in progress means presentation, on the one hand, of information to other members and, on the other, of positions or points of view about controversial issues. The former, being straightforward and factual, naturally arrive in a copious flow; the latter must, on the whole, be solicited and may particularly be worth offering an honorarium for. They entail much more work and do not get the kind of feedback that the discovery of a number of others working on or interested in the same problem can generate. Even so, a point of view section should be encouraged: an important characteristic of a rapidly changing field is its controversies and, to the extent possible in an informal print medium, they should be aired. No doubt, symposia, with proceedings, are better for this purpose, and thus should be considered as an auxiliary network service, if a budget can be made available.

Whereas the core of a newsletter is work in progress—of whatever kind—for the central purpose of making news about such work as immediately available as possible and thereby creating a community of interest that bypasses rigidities of time-lag and formal presentation, attention must also be paid to work about to be formulated and, of course, to dissemination of work in advance of full or formal publication.

With respect to formulation, we have tried to develop a 'Request for Assistance' section, but it has been relatively unsuccessful. Naturally, individuals feel somewhat reticent about sharing their doubts and formative ideas through the medium of print. Consequently, it seems worth developing a less public system, through the network's secretariat, in which ideas and problems are sent in on a private basis. The secretariat then makes discreet inquiries of experts or likely collaborators, or itself runs a more formal consultation service as a separate entity. Models for this already exist and experience is available for constructing such a service. Here, the information sharing service shades into a personal assistance service, which it may be more appropriate to centralize than to keep decentralized by means of a simple notice in the newsletter.

Dissemination of work, in advance of end-result publication, can be achieved in several ways. One of these is by offering a comprehensive section on upcoming conferences in the field, where to get information about them, and, if appropriate, some summary of work presented. Usually conferences are known to limited circles and their proceedings have limited circulation. A newsletter can provide valuable services, not only by announcing but also by casting a critical eye on such events.

Interestingly, we have eperienced great difficulty in developing regular channels for getting news of conferences. We attribute this partly to the very fact of our informality, but, more importantly, to the fact that no general system for setting up conferences exists and they happen on a relatively haphazard basis. Whereas individuals have an incentive to tell us about their own or colleagues' work, they have little incentive to tell us about conferences, except in the unlikely event that they are the organizers. It may be that Unesco is in a better position to provide such a service.

A second way to get access to dissemination of work is to develop a section for announcements. This section could contain everything that does not fit elsewhere and give information about dissemination stages: network members wish to publicize their work.

Probably the most useful way to cover dissemination, apart from the end-result library accessions list, is to develop a section in the newsletter for follow-up on projects already presented at an earlier stage. We are doing this now by requesting follow-up information to the time of the last stages of a project already presented, sending a personal letter if necessary.

Other newsletters we have seen tend to focus on the activities of individuals, chronicling their rise, transfers and publications. We chose not to present such material, first because of space limitations, second because it is surely the substantive information that is of prior importance. In fact, we have discovered that there is really no demand from our members for a membership roster, which further confirms our editorial position.

Because we have chosen a decentralized or collective approach to networking information, our newsletter does not give a lot of material about our own institution or about what we think is important for our readers to think or do, as many other newsletters choose to do. Besides freeing communication channels by adopting a non-élistist, collegial position, the budget needed for the secretariat is considerably reduced because no effort is put into amassing and controling information.

On the other hand, because of the screening process for membership, we have had relatively few problems with quality. Only one or two out of some two hundred contributions have been rejected; several have been improved by requests for further information; some have been severely edited; but most have arrived in usable form, except that a number have required translation. The editor's work-load, then, is considerably reduced in comparison with the typical news-gathering operation. It is thoroughgoing only in the cases where contributions have to be solicited and material received put into the normal newsletter format.

It is important to repeat here that the network coverage, and specifically newsletter organization, are relatively independent of the actual content determined for the network, that is, the actual topics or fields covered.

DETERMINING MEDIA AND TRANSMISSION

Media and transmission, with particular reference to presentation, language, design, clarity, layout, size, frequency and speed of distribution, should be determined in broad outline in the early stages. A broad-banded group scattered around the world requires at its core, we believe, the most widely available medium—print—and the most widely available distribution system—the postal service. Print provides a wide range of formats, from the formal to informal, the latter being lowest in cost. The international postal service provides, whatever its faults, a comparatively cheap and reliable distribution system, especially when air mail is used. The innovative networking activity we have described demands, as a central focus, a newsletter, backed up by individual correspondence and supplemented, on the one hand, by a more formal end-result library-based network and, on the other hand, by various forms of personal contact, such as conferences, expert consultation, etc.

All printed materials must have maximum clarity in order to be informative, so great attention must be given to design, layout, presentation, language and size. Because of budgetary constraints, we have been forced to publish a single-language English edition—a severe constraint in the international context. International agencies publish in as many languages as possible. This will permit a relaxation from our own rather austere single-language format. Graphic designers familiar with cultural differences should be consulted in order to assure attractiveness of presentation without loss of clarity and simplicity. Normal journalistic rules about headlining, paragraphing, subparagraphing, etc. should be employed to maximize readability.

A standard format for presentation of projects, programmes, follow-up, etc. assists contributors and readers alike, if sectioned and broken up on the page for ease of reading. Our own network evaluation has brought out that almost two-thirds of our members first skim the newsletter and then settle down to items of particular interest; about one-fifth read the whole newsletter quickly; the rest read it all carefully. In other words, not only does an apparently homogeneous group have divergent interests in reading the material but, for the majority, time-saving design features are extremely important. It is also important to offer more than an annotated reference: there should be enough information about organization, theory, level of effort, methods, dates, etc. (as appropriate) to allow readers to assess worthwhileness of further contact without the extra effort usually required when news items are short. Finally, of course, the name and address of a person to contact must be included. In all this, the guiding principle is to increase information flow by maximizing clarity, readability and ease of contact. The same principles apply to end-result formal networking activities, where formats are more standardized already and there is therefore better understanding of how to use the medium.

Size and frequency of, in our case, the printed newsletter are also related to readers' needs. Size, i.e. length, has to be tailored to what a busy person can reasonably deal with in a short time. Some flexibility in length is possible. But if flow is increasing, unless some items are reduced or dropped, frequency will have to be increased. From the editorial side, regularity of frequency is essential to demonstrate that the newsletter is reliable. Deadlines for each issue should also be established to stress the time-value of the information.

In order to produce the newsletter quickly, we use an IBM Mag Card/A typewriter, which allows easy editing. Editing can also be done with some computer programming systems with visual display and this can be convenient if the editor is travelling and has access to a terminal.

Printing is done on regular stock by offset or another cheap printing method. Here again, because informality—working information— is being emphasized, there is no need for high-quality print on heavy stock with a glossy look.

Both because of weaknesses in the international postal system and in order to deliver the information in a timely fashion, we have chosen to use air mail for our newsletter and surface mail for our library accessions list. We find that seven out of ten of our overseas members consider air mail essential. We have experienced few problems with air-mail distribution: only 3-5 per cent of our membership have failed to receive all issues sent out so far. Surface-mail distribution, however, has generated several complaints and we would like to abandon it in the case of certain regions.

CO-ORDINATING THE NETWORK

The size of the secretariat set up for this networking system naturally depends on the complexity and diversity of services offered, areas covered and levels of experts addressed. However, journalistic experience is certainly needed to set up a system that will avoid the less attractive features of publications associated with bureaucracies. Expertise is also needed to organize the production-distribution process in a timely fashion. The secretariat must also have the capacity to develop and maintain individual contacts in writing, whether or not personal visits are included in the budget. It may also prove attractive, in a larger system, to employ regional information collection/dissemination editors or co-ordinators in order to increase the comprehensiveness of the news service. Such individuals must be both active in the field and in a particularly good position to find out about work in process in the region and transmit it, and to discover new active members for the network.

Different content/topic areas do demand differences of emphasis in networking approach. For example, our own content area—educational finance and planning—is an established area with a typically system-wide application. Non-formal education or educational technology, by contrast, are relatively new content areas and basic information may need to be circulated, in the first instance, from a central repository,while particular projects may be much more localized and decentralized. Thus a broader network may be required under these circumstances with many more cases of practical application offered.

Apart from this content/topic variation, the continual arrival of newcomers into the field may suggest, beyond the necessity for training schemes, the development of basic information services. These imply a central repository and some already exist. They would constitute a separate network service for a particular audience—new members rather than old colleagues.

The development of such services, apart from a core service of news dissemination, is a matter for discussion. Great flexibility exists in the size and application of networking activity. The budget can range from, at the simplest level, 20,000 to several million dollars.

Whatever the level of complexity, however, the challenge for the network's secretariat in a paper-based network is that of maintaining morale, that is, of making the members feel the service is worth contributing to, so that the information circulates and contacts are made and cemented. Support by means of personal letters of thanks, encouragement and inquiry must be continually offered to as many members as possible. It is extremely valuable for the secretariat to travel and visit, as well as receive visitors, in order to make personal ties. It would surely be useful, although expensive, to put on conferences from time to time, although it might be a delicate matter to limit invitations. Apart from these forms of personal contact, a general atmosphere of interest, respect and concern must be shown to exist on the part of the secretariat, as well as efficiency and effectiveness in getting information out.

One important aspect of maintaining morale is the sensitive matter of removing those who are no longer active in the field. In contrast to those projects which measure effectiveness by mere expansion of the network, irrespective of the dilution of participation inherent in such expansion, we have chosen to maintain our network at a certain size by removing those not contributing and replacing them with those who can contribute, as explained above. By publishing a regular membership list, we demonstrate to our network that quality is being maintained: only the active experts are included.

Good network morale, in summary, is really the product of a system devised to include as many as possible of the properties and strategies suggested above. We have, by our own efforts, demonstrated that, with great cost-effectiveness, network morale can be very high.

Lines of development of an international network

We are arguing that a key innovative area for networking activities is that of work in progress and we have delineated the properties that have made our own network of maximum usefulness to our members—panel membership, individual basis, informality, decentralization, etc. Even if these properties cannot be achieved in themselves, they should be acommodated as far as possible in a more formal structure. If a networking operation is to be developed in the end-result area as well, such properties will also be extremely helpful in maximizing true participation.

In any case, given the flood of information and rhetoric normally available, direct and honest presentation of real information, transmitted in a timely fashion, will independently make networking activities valuable to members. Isolation and specialization both require a straightforward information service.

Budget considerations recommended, as a core, a print-based mail-distributed network, demonstrating, however, as many interpersonal collegial properties as possible. Such a network can be articulated into a complex of several print-based services and can be expanded as well into a number of people-based services.

People-based services already have a model in the expert-consultant or advisor roles developed in an international context. Such roles are relatively well understood and have been written about. The focus of people-based networking needs to be, on the one hand, on the formulation stage of projects—research, implementation or training—in which diplomacy and personal contact are particularly appropriate and, on the other hand, on the more ceremonial occasions, such as conferences, at which colleagues gather to share controversies, conclusions and results. As conferences have known organizational problems, careful attention does need to be paid to the possibilities for formulation-stage services. The availability of such services has to be made known, but the initiative has basically to come from those who will receive the expert advice if the service is to be effective.

In addition, given the continual development of countries and the continual arrival of new members into a network, there is always a demand for another type of service, that of provision of more basic information and assistance. Clearly, this is a point where end-result print-based networks have an important role to play as well, whether as a simple bibliographic service or a more sophisticated computer-assisted annotated bibliographic service. However, it has been precisely in the operation of such services that interpersonal contact has been particularly recommended in the literature: the bibliographic service is particularly impersonal.

Finally, there is no doubt but that the reception of visitors by the network's secretariat and, more effectively, strategic visits by it to the individual members or to gatherings such as conferences buttress the network in a way no paper-based communication can. Such contacts, therefore, should be an integral part of the network or networks developed in educational policy and planning.

PART IV

INFORMATION SOURCES

There is much information about
networking around, but much of it
is complex and confusing, with
implications for practice unclear.

Matthew Miles

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An analytical bibliography on the theory and practice of educational information networks

Roger Pritchard[1]

Introduction

'Network' is a term that has become extremely popular in the last ten years or so (as reflected in the clustering of dates of references in the bibliography), both among academic disciplines and among practitioners and the public. It has proved to be a satisfying term to use. Some of its major uses will be pointed out.

Generally speaking, 'network' implies connectedness, co-operation, resource-sharing and complexity of relationships, whether at the individual, group, institutional or other levels. These implications exist whatever the cross-cutting variables, such as formality or informality, value-conservation or the pushing of new values, etc. Pattern and exchange are thus basic implications.

Analytically, five important senses of 'network' can be distinguished. These senses fail to be distinguished by many authors so that more confusion than necessary results:

(a) As a medium of transmission, with or without storage, exclusively. In this sense, a network exists whenever distant points are connected by a medium. This medium may move people (with information), as do roads, rail, ships and airlines, or it may move information between people, as do the mails, the telephone or the computer. When the medium is used, the rest of the organization of the information sending/receiving/exchanging may vary widely, but a network form is involved, with the potential for turning the world into a community. Here the terms 'system' and 'network' are interchangeable.

(b) As an inter-organizational arrangement to conserve financial, staff and information resources in the face of massive increases in the content—

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[1] The direct assistance of over 100 people who provided information for this analytic bibliography is acknowledged with thanks. Naturally, the stance, analysis and opinions expressed here do not necessarily reflect those of the contributors or of Unesco. Thanks are also due to Ms Joan Killeen for typing the final version of this report.

information or other services/products—and inadequate financial, etc., resources to deal with it and give service on a single institution basis. Here interlibrary co-operation, inter-agency pooling of services to the community, etc., are examples. Here is indicated an adjustment to the information explosion of our century in terms of limited financial/staff resources, including rationalizing services to avoid duplication and overlap.

(c) As a necessary form for the integration of societies. General social networks are in this sense seen as the basic form of social life, and information is one of the things exchanged or channelled through them. They are informal. Whether people are defending their communities and values or changing them, they do so through network arrangements; and whether they are resting happily or looking for assistance and information, they do so through network linkages. Their success and failure to reach out and the quality of their lives can be seen in terms of the networks they are in and those they reach out to. In traditional societies, this was done face to face but in contemporary urban societies various media assist further-reaching and more open-textured connections.

(d) As an organizing strategy for individuals, groups and institutions, but more likely individuals and groups, to bring social change and innovations into a socio-political system that is rigid, poor at adapting to change, but powerful and able to resist. Networks join and unite those who are desirous of joining in a movement to bring about change or oppose undesirable directions in which 'the System' is going. By its flexibility, egalitarianism, commitment and resource-sharing in terms of effort, finances, etc., networking in this sense is a strategy for bringing about social change. Some authors use the term in this sense and even with these limits find confusion about strategies and tactics.

(e) As a necessary organizational form for all societies in our age because of the continuation of rapid social change, arrival of crises, overall limited resources on the planet, and the inablility of the State and traditional forms of enterprise to deal with the changes/crises/limited resources. A network organization of institutions, groups and people, across the board, is a necessary adaptive response if mankind is to survive.

The five senses, then, imply pattern, connectedness, complexity, exchange, co-operation and resource-sharing, and refer to networks (a) as a medium of transmission, (b) as an inter-organizational arrangement, (c) as an informal general basic social form, (d) as a form, more or less informal, with strategic application for movements bringing about social change, or (e) as a generally necessary, informal or formal, interpersonal or inter-organizational, form to enable adequate response of societies to rapid social change, uncertainty and limited resources.

Sections of the bibliography

The bibliography follows these analytic divisions to the greatest extent posssible.

There are sections on analysis, first, followed by sections on cases. It has not been possible, given the early stages of development of the concept as an analytic tool and of networks, particularly in the context of rapid social change, as an organizing form, to achieve full integration. However, given the stage we are in and the range of ambiguity we face in using and applying the term, we have achieved a real advance on previous work.

The first analytic section is on library, information and computer networks. Here, as mentioned, network and system are interchangeable terms. Why? There are two main thrusts in the library/information science literature: one is analytic sense (a), referring to the medium, especially computers and telecommunications; the other is analytic sense (b), referring to inter-institutional resource-sharing in the face of the information explosion, given that documentation and data information are the product and/or service of these institutions. The fact that there is inter-institutional resource-sharing does not, in this case, imply anything about whether the form of organization will be hierarchical or not. That is, the inter-institutional co-operation still presupposes 'users' of the co-operative services, who are not members of the institutions. The fact that the telephone company uses a physical network does not tell us anything about whether or not it charges high rates; the fact that libraries co-operate does not tell anything about whether better service is provided to users. By contrast, the second part of the fourth section, on inter-institutional networks aside from libraries, etc., presupposes that networks are a distinct form of organization. They are contrasted with bureaucracies, which are found to be inappropriate in the face of rapid social change and the uncertainty it generates. In the library/information science literature, there is little, if any, discussion of inter-organizational arrangements in these terms and the novelty focus is on the technological developments of media, and their consequences. Libraries are compatible with bureaucracies in many ways.

The second analytic section broadens the sense of 'information network' found in the literature of the first section. This is mainly in analytic sense (c), general informal social networks, and draws mostly on the anthropology/sociology traditions of the past fifteen years or so. Here social networks are connections between individuals, groups and institutions, through which many things may pass back and forth, including necessarily information: communication is an integral part of the connectedness of networks. Networks are general phenomena and may serve conservatory or innovatory purposes. Social network analysis evolved mainly as a reponse to structural-functionalism: the latter focused on how individuals, groups and institutions fit into a social system, while the former reacts by examining how individuals (mainly), groups and institutions form connections to maximize their self-interests (or fail to maximize them), with exchange of services of various kinds. Individuals are the main units of analysis, apparently because kinship groups, communities, élites, secret societies, etc. have the main centre of attention and because, until recently, analytic techniques have not been developed for groups and institutions. A major contrast, in social network analysis, has been between traditional societies where people live in face-to-face, low-technology, intense, closed and dense relationships and urban societies where people live in high-technology, ramified, open and scattered networks: from small societies to global society.

The third section applies some of the social network analysis. In the first part, some interesting research on the 'small world' problem, the search for jobs through information contacts, and the relations of governments to communities in trying to achieve social change is mentioned, which introduces issues around the interface between individuals and institutions. In the second part, more focused research on social networks in education is reviewed, in this case dealing explicitly with attempts of the Federal Government in the United States to find alternative ways of encouraging innovations among practitioners, i.e. teachers and administrators, and in communities, especially low-income or otherwise discriminated against communities. This literature applies both sense (c), general informal social networks, and sense (d), social change networks, and to some extent sense (e), general institutional mobilization. That is, 'network' is used both as a general term and as a term referring especially to social change movements and a general state of social uncertainty. Thus, although the government is 'the System', it also wants to maintain flexibility in assisting social change to come about.

The fourth section turns to institutions. The first part rather briefly looks at intra-organizational analysis with respect to communication within the organization. Communication analysis is a relatively new general technique in the examination of maintenance, production and innovation processes. Communication problems are usually seen as internal problems. Informal social networks are recognized as well as formal channels. The second part looks at inter-organizational relations, where the unit of analysis is organizations as well as individuals and units or departments. Here, there is a strongly developing stress on sense (e), as already mentioned. That is, organizations in the modern world are seen as being required to form networks rather than bureaucratic patterns in order to cope successfully with uncertain conditions. Corporations, by becoming multinational, are seen as adapting well, while bureaucracies, even in the centre–periphery model, are seen as failing. The relatively restricted sense (b), general inter-institutional resource-sharing, occurs little here.

Because issues of innovation and social change, partial or total, episodic or continuous, stand behind much of the analysis of networks, a section is included on diffusion and exhange of new ideas, theories, practices, etc. There has been substantial work on 'invisible colleges' of researchers, as well as on the chains of diffusion of rumours, voting decisions, absorption of mass media messages, adoptions of drugs by physicians, as well as of other novelties.

An important omission in the bibliography, to which attention should be drawn, is the almost complete absence of references to mass media (radio, television, newspapers, magazines, etc.) as both technical networks and formal information delivery systems/networks to a wide range of people, far wider, of course, than the range served by library/information networks and systems.

There are two sections on cases, some fifty in education and some twenty outside. Cases of 'networks' in sense (a) are included in the education section but not the other section. Sense (c), ordinary, informal social networks, is not included for obvious reasons. It is in senses (b), inter-organizational resource-sharing, (d), social change (especially), and (e), general institutional mobilization that most network cases can be analysed. However, it is fair to say that we have not developed an integrated analysis at this point. Some general comments about why this is so follow:

First, documentation varies from full evaluations by outside bodies, through case histories to brief descriptions, pamphlets and products such as newsletters, to personal correspondence,

Second, this variation reflects the wide range of types of network, from expensive/institutionally sponsored/outside-evaluated to no direct cost/interpersonally related/membership-evaluated (simply by continuing the arrangement).

Third, the relative paucity of cases with reasonable documentation at the national/regional/international levels, with the main exception of library/information networks/systems and United States Government-sponsored networks, has led to inclusion of other cases (a) at the sub-national regional and local levels and (b) outside education in other sectors that have developed networks earlier than education has and thus offer more documentation.

Fourth, even so, there is not enough information to develop a matrix or other more analytic form, with confidence; but, in respect of certain elements in networks, such as variations in institutional affiliations or facilitator/hub characteristics, some analysis can be done.

Finally, it is worth noting that the bibliography is oriented to modern Western societies. Obviously, this is not because informal and formal information networks fail to exist in developing countries but because, particularly on the analytic side, there is little or no literature; on the case side, there are several examples, particularly those sponsored by Unesco.

Unesco and information

Two key features of Unesco that have to be kept in mind as we conduct this analysis are: (a) it is an international bureaucracy of considerable complexity, with a central secretariat and decentralized offices and specialized bureaux; and (b) its mission is one of creating formal links of co-operation with member governments towards a specific objective and of co-ordinating the resulting activities.

Penna (I, 1976)[1] reviews five basic trends in the last thirty years of Unesco's assistance to Member States in documentation, library and archive (DLA) services: determining with greater precision the principles and structures of DLA services, especially with the development of National Information Systems (NATIS) and the World Science Information System (UNISIST) in the 1970's; internationalizing the services in collaboration with the profession; developing standardized techniques and procedures for acquisition, administration and handling documents; training professionals; and promoting books.

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[1] Roman numerals (I, II, etc.) in references indicate the section of the bibliography in which the work will be found.

This long-standing DLA tradition at Unesco, including the recent development of the technologies of computers and telecommunications, puts Unesco mainly in the library/information science tradition when it comes to information. That is, information is seen as documents or other formal materials in some medium subject to intergovernmental and inter-institutional transfer. Unesco provides services to or co-ordinates services among member governments, including offering training and developing the sophisticated modern computerized systems/networks that hold such promise for the future.

There is a newer thrust to Unesco's programmes. This consists of innovation-related documentation networks embedded in broader networking arrangements in the form of technical co-operation between developing countries (TCDC). This thrust is a much more flexible one and demands organization responsive to current developments. Here, Unesco puts itself among those who recognize the continually changing nature of society and the need for more responsive forms of organization to deal with the changes more successfully.

Whereas the latter programme is innovation-related, the former more general programme is not explicitly given a particular thrust except in so far as basic raw data, basic bibliographic data and basic current awareness data are seen as necessary and important.

In education, we can illustrate through the example of IBE a decentralized specialized agency concerned with educational information. Since 1971, IBE's goal has been to work vigorously towards establishing a world system for the exchange of educational information. In so doing it has been developing networks of existing institutions concerned with information flows in education, at both international and national levels. The major network components are national centres dealing with educational documentation, research and information.

The thirty-sixth session of the International Conference on Education in 1977 recommended that Unesco should 'play a leadership role and should undertake the specific task of developing a plan for a world information network in education' (Unesco: IBE, I, 1977*a*).

The networking approach was defined as one 'by which existing or new regional information programmes are interconnected and linked into a worldwide network'. IBE recognizes that such a network tends to have restrictive qualities: the codification of experience by official bodies in traditional form, the building of international programmes from the top down to a limited group of national and international administrators as users of the information, etc.

At the same time, the special component of IBE, the International Education Reporting Service (IERS), which was established in 1974, has focused on the exchange of information about change, such as reforms, actual cases of innovations and suggestive policy-oriented research. The concept of change locates IERS, together with the innovation-oriented regional networks at Unesco regional offices (of which APEID, authorized in 1972 and started after appropriate planning in 1974, is the first example), away from the main line of information centres for codified information. Furthermore, APEID and succeeding networks are explicitly based on the principle of resource-sharing: 'The relationship between the participating Member States is not one of donors and beneficiaries but based on reciprocity, mutual learning and self-reliance' (*The Asian Programme of Educational Innovation for Development* . . ., VI, 1977).

Thus, whereas the main thrust of IBE's programme is the development of a world information network in education, which may well have restrictive features common to formal information systems conceived as documentation systems joined together in a network, a second thrust is the development of information networks conceived as documentation/technical assistance networks for innovation, in which research results, results of cases of innovations and of general reforms are made available and exchanged. Here information does not stand by itself but is part of action.

The five analytic sections of the bibliography: a review

INFORMATION, LIBRARY AND COMPUTER NETWORKS/SYSTEMS (I)

One professional field in which the concept of 'networks' has been used and developed for some years, and for which there is a substantial literature, is that of library and information science.

Librarians and, more recently, information scientists, together represent a strong 'information' tradition with secure institutional bases. Both in themselves and in the absence of challenges from other formal conveyers of information, they are able to develop their documentary tradition more or less on their own terms. No one is 'against' information, even if it is not defined.

The other main institutionalized conveyers of information are the news media, which concentrate on developing stories as information, these being seen in the library tradition as 'fugitive material' except in so far as newspapers are collected as data for history.

Libraries have traditionally defined themselves as repositories of information whose value is not transitory but long-lasting. They tend not to like 'fugitive' material, which it is expected will be covered in the mass media, professional newsletters and other transitory publications. Likewise, they see the media as covering 'news' as it happens, while they cull those documented aspects of newsworthy (or not newsworthy) events that have lasting impact. This definition is a source of rigidification in service-definition analogous to that of bureaucracies compared with less formalized institutions and groups. It also provides a selection mechanism for material to be acquired and kept.

We start with this substantive field because it is of direct interest to Unesco. In terms of our five analytic senses, it tends to use the first two senses. Behind each is a general concept, in which nodes exist with interconnections.

In the first sense, the nodes and connections are simply physical; in the second they are inter-institutional. It is implicit in the first sense and explicit in the second that 'resources' of some kind are being conserved. Interconnectedness is related to mutual support.

The second sense of 'network' is more general, while the first is associated with newer developments in computers and telecommunications, as media, for storage/retreival and for distance-reduction.

Although we have suggested two analytic meanings, library/information science literature shows continuing confusion about the term 'network':

> To interpret the word networking as referring only to an automated or computer-based operation is misleading. To quote a well-worn phrase, networking means different things to different people. There are many different types of networks in existence today–different in terms of the services they provide, the people they serve, and the areas they cover. Some use the mails, some telephone, and others (or perhaps the same) use delivery trucks and teletype. They may not make use of any automated or computer-based techniques, and yet they, too, refer to their operations as networking (Trezza, I, 1977).

The terms 'network' and 'system', as already mentioned, are used rather interchangeably in the literature. The two terms are not, apparently, seen as opposed but rather as emphasizing different aspects of the same issue. The network side emphasizes patterns of interconnections between nodes, while the system side emphasizes the internal processing, switching and other operations on the material flowing through.

It is clear that we are dealing with a formal inter-institutional arrangement which creates a new pattern and entails various management problems that may be approached through systems analysis. Overall, library/information systems/networks can be seen as relatively recent attempts to introduce new systems to share bibliographic resources and provide improved services to users. Much attention is given to hardware, management issues, planning and implementation and formal legal and political considerations, but rather little is actually given to users.

Whereas social networks are informal, and in the social change sense exist or are set up as alternatives and challengers to formal systems, particularly governments, information networks are formal, with legal agreements, charters, organizational and consequent management considerations, etc. While social networks are interpersonal, library networks are inter-institutional, although presumably for the ultimate benefit of individual as well as institutional users.

The extremely varied kinds of network relations have been developed in this tradition to achieve economies of scale and to take advantage of new technologies. Management, planning and other modern larger-scale approaches have been adopted, especially because the new systems/networks, although expected to be cost-saving in the long run, require a large initial capital outlay in most cases.

One thrust for these arrangements is, then, that economies of scale can be realized in the face of increased information, greater numbers of distant users, and the failure of budgets to keep pace with single-unit costs. The face-to-face library/information centre is being replaced by a media-dependent set of interlinked centres. In this sense, documentation networks' development mirrors social networks' development.

The second thrust is that the new technologies of computers and telecommunications in themselves suggest novel modes of moving and storing mainly bibliographical data but also raw data, management data, etc.

Co-operative networks more generally entail interconnectedness for resource-sharing. This applies both to libraries, the more recent information services and other types of information/documentation services. Because libraries have very clearly defined procedures, co-operative activities, whether or not assisted by computers, deal with the fairly standardized and labour-intensive selection/acquisition/processing/cataloging/inventorying procedures; abstracting/indexing for reference; and inter-institutional exchanges of material. Circulation, processing of serials, and fiscal control are less subject to co-operative arrangements and computer processing.

It is intended to make all documentation available in some form to consortia member institutions while avoiding unnecessary duplication; in extending the consortia, it is necessary to build up new library centres and staff them appropriately so that they may participate, whether to input, take out, or do both. In cataloguing, it is important to share the work and also use compatible classification schemes; in abstracting, it is important to choose a language understandable to the user; in exchanging material, speed, relevance, reliability, etc. are important, so long as costs are controlled.

Physical networks involve transmission plus, in some cases, notably computers, storage in a new medium. Networks of interlinked nodes can take several shapes, for example: star; net; ring; distributed control; fully connected. These shapes, or topologies, imply various degrees of hierarchy and centralized control. Any system/network makes basic decisions about hierarchy and control in adopting a particular form. Distributed processing networks hold the most promise for complete decentralization, while star networks imply the most centralized control. Network shapes are dictated to some extent by availability of hardware. (For example, the new generation of mini-computers has decentralizing implications.) Whatever the network shape, general technical issues include switching capacity and the compatibility of systems to be interconnected.

But there is no doubt but that through computers powerful new documentation approaches, such as selective dissemination of information and on-line retrieval, can be offered, within the bibliographic limits of various approaches developed. 'Current awareness' is particularly important in view of attention to new developments, innovations and fast social change.

Although in several ways it belongs in the diffusion section, mention should be made here of the interesting development of computer conferencing as a device for dealing through telecommunications and computers with distance problems of conferences as well as interactional problems: conferences can be rendered asynchronous through the storage feature of computers and people at vast distances can be brought together. Participants may either stay in their usual location or proceed to one or more centres. For conferencing, they can enter information and receive it, modify it and replace it, in an asynchronous fashion: locations can be diverse and time-staggered. The most sophisticated version is EIES (Turoff *et al.*). For diffusion or development of specialty networks, the National Science Foundation is at present conducting experiments with EIES.

Many writers consider that technical issues can be taken care of fairly easily, although switching, compatibility of systems, standardization of language, etc., are not simple, especially in the face of multiple native languages; they think that the main issues are economic, political and social. Financial/political decisions do seem more important, including decisions about what sort of network structure and shape would be appropriate for the institution, government or international body. We would agree that major attention has gone into internal-to-the-system issues, as it has in other fields, and that some important issues have been neglected. Before we turn to these, we would refer on to several of the approaches on inter-institutional arrangements in Section IV of the bibliography. There, we find an important analytic tradition arguing that potential innovations in a time of rapid social change meet a dynamically conservative tradition in institutions and are best conveyed by a specifically reduced-hierarchy network arrangement. We may expect that, in library/information science itself, as well as in the broader political world in which libraries and information centres sit, there exist dynamically conservative resisters as well as those trying to bring about new conceptions of information networking.

Libraries are not incompatible with bureaucracies. Both can have dynamically conservative stances. Libraries are in the business of conserving documents and acting as repositories. Thus, their tradition is not one of keeping in continuous touch with new developments—this is done by the media and the recently developed information centres. Their services are not particularly geared to a continuously changing world. Although open to the public or to a special group, they are not necessarily easy of access in terms of their products and services. Their relative insulation may be pointed out through the following critique.

Fife (I, 1977) has stated that libraries tend to be passive in terms of reaching their users: the user is almost always required to go to the library to find out what is available. 'ERIC and other information systems . . . have not seen, as part of their responsibilities, the training of users. . . . This may be too much to expect of any information system.' Bonnefoi (I, 1977) found in his review of user studies in the library/information science tradition that there has been very little systematic investigation of users' needs and actual use of such services, nor have evaluation criteria been developed in any systematic way for evaluation purposes. UNISIST, while recognizing three types of information movement (informal sources, more formal sources and data sources produced in tabular formats), and while quoting Price to the effect that 80 per cent of research input among scientists comes through informal networks (UNISIST, Central Committee, I, 1971, chap. 3), does not seem to have devoted effort to investigating informal networks and how they could best be interfaced with formal systems, but rather to have concentrated on development of the sophisticated and imaginative large-scale network/system-enhancing efforts currently in progress.

Apart from user access issues, Fife (I, 1977) has also pointed out, with specific reference to the process of generating research information and disseminating it in a timely way, that 'fugitive literature makes up a majority of the literature produced on education'. This is why ERIC was developed; the Current Agricultural Research Informations System (CARIS) in agriculture is another formal network system for a similar purpose. The more informal network developed by Pritchard (VI, 1977) is an alternative approach, using interpersonal networks and exchanging information through low-technology media. In life, generally, most important information is 'fugitive'.

The issue of 'user access' surfaces when there is an inner group in a social service institution providing a service to outsiders and questions of openness and satisfaction of outsiders' needs arise. The 'user access' issue is a particular case of the general issue of ready or restricted availability of a service to people who need it. It is always an issue to what extent scope of material and access of users will be widened or narrowed. The *Study Report* of the UNISIST Central Committee (I, 1971) urged formal systems/networks as a means of widening access; but the thirty-sixth International Conference on Education and the Educational Policy and Planning (EPP) Symposium both recognized the restrictive qualities of the systems. It is always an issue to what extent the material put in and the users/members will be screened and selected. Information systems/networks have been criticized for putting in too much poor material. Apart from this, questions have been raised about the extent to which, even with keyword treatment, computer-based systems can provide sufficiently trustworthy précis of material that it convinces users to cover the material in its entirety.

At this point, it is worth developing a key idea behind this bibliography: the extent to which informal networks play an almost infrastructure role to formal information systems. The information that people exchange in informal networks is sought and given on the basis that it is parsimonious and trustworthy in relation to the needs of the receiver. We can introduce the idea with two quotations:

> The immediate stimulus to my interest in how scientists discover relevant research was a questionnaire I received from a graduate student in library science. She asked me how frequently I used various information retrieval facilities in my research. A number of them I hadn't known existed, and there were none that I relied on (Murray, I, 1978).

> Governments and international bodies while accepting (in some cases) the importance of the personal communication subsystem have as yet rarely taken practical steps, based on the importance of the interaction between the formal and informal systems in the total information system. Their main response to the information problem has been to develop, or propose, major computerized abstracting systems, library cooperation mechanisms and the like, while hoping the 'informal' subsystem will take care of itself.
>
> In cost/effectiveness terms, however, this is not enough because the formal subsystem is only part of a larger system . . . (Cooney and Allen, III (a), 1974).

The basic fact here is that information users cannot operate without using the informal networks through which trusted and relevant information is shared.

Formal systems/networks presuppose such networks. Cooney and Allen call the persons who, in their context of technology-developing companies and other related institutions, receive information from a wide variety of sources external to their organization and from sources inside it and act as key information sources for colleagues, 'technological gatekeepers'. They point out that the diffusion literature has discovered that between, say, mass media and individuals there exist one or more people through whom the information goes before it is accepted, so that, in general, the interpersonal networks through which information flows are crucial in making information spread and gain acceptance. The point about interpersonal networks seems to be able to be generalized.

Why does the interpersonal network continue to operate? It seems that the network's key members perform a selection and shaping function for the membership that no formal, including computerized, service has been able to provide. It also probably performs a normative function, in the sense that information selection/shaping will tend to validate the members' values and needs. This has been demonstrated by the anthropologists (e.g. Boissevain, II, 1974) in terms of community and kinship networks, and certainly operates in organizational contexts too. Personal influence, as we shall see subsequently, is also crucial.

It therefore becomes appropriate to move on to the literature on social network analysis. Further, we are suggesting that analysis of 'dissemination' can be applied to analysis of 'users', to whom information is, in a different sense, being diffused. But in the diffusion process, formal systems/networks need intermediaries. Even with a few user-helpers in libraries/information centres, assisting at the interface, it is problable that people would also rely on informal networks.[1]

One interesting development here in the library/information science literature is a focus on 'information brokers'. These are individuals and institutions that, on demand, seek to answer questions using all sources available. It would be worth examining them further.

SOCIAL NETWORKS: GENERAL (II)

In the social sciences, social network theory, theory about informal social networks, in analytic sense (c), has developed to an appreciable extent in the past ten years or so. There has been considerable movement from using 'network' in a metaphorical sense to using it in an analytic way, although the sociometric tradition (Moreno, II, 1953) has been in existence for some time.

As with physical networks, the basic idea is that of a set of nodes—which can be persons, groups, institutions, etc.— which have links or linkages between them. The developing analytic tools are related mainly to topology and directed graph theory. Here it is patterns of interrelationships that are of importance. In this sense, network theory stands in contrast to causal theories. It is interested in both the presence and absence of ties, equally. It examines both structural and interactional properties.

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[1] I in fact did so in preparing this bibliography. I found less than 5 per cent of my usable citations through strict library searches and (SDI) Selective Dissemination of Information print-outs. I did go to libraries but in search of material already recommended, which led me to more individuals and more material.

Structural properties of networks that exist and are mobilized under certain conditions for certain purposes include size, ramification/density, reachability, range, centrality and clusters; interactional properties include single- and multiple-strandedness, directional flow and frequency/duration.

Whereas structural-functionalism examines how parts fit or fail to fit into a whole social system, network analysis reacts by examining how individual nodes try to maximize their separate interests by exchange with others, although each node has different interests and will change in its networks over time.

Although the 'unit of analysis' may be individuals, groups and institutions, anthropology and sociology, for historical reasons, have focused on individuals and their social networks. Anthropologists were interested in kinship, communities and the move of individuals to urban areas; sociologists were interested in modern urban communities and the connections within and between them. Therefore, although it was recognized that every individual is connected ultimately to every other individual, 'partial networks', with first-order, second-order, etc. zones radiating out from the individual, were first exmained.

An additional reason for examining small networks was that there were not any available techniques for analysing large topologies. However, these have been developed more recently, as we shall see in the section on organizations.

Once the idea of links and interconnectedness is established, it is possible to take another perspective and examine the number of steps it takes an individual to go through networks to get something desired. Not only is information, among other resources, exchanged; it is actively sought out. We shall return to this in the section on applications (III).

Network analysis has been particularly interested in the movement from dense structures into which everyone fits in multiple-stranded linkages, that is from traditional societies, to open, ramified, greater range, more single-stranded networks, that is, to modern urban societies, in which there is an important dependence on modern technologies to make the connection.

This general analysis of networks has no bias towards innovation or conservation but may consider all networks equally. Clearly, the shifting groupings and coalitions in network form have some normative function in terms of which people will feel they belong, can trust the membership, can give and take, exercise or respond to power, etc. It is possible to develop choice-constraint models here, given the patterns and limited alternatives and resources, of benefits and costs of options, choices and preferences. Thus, networks can be seen both as constraining (Fisher *et al.*, II, 1977) and as permitting fluidity and movement (Boissevain, II, 1974).

Although there is no necessary bias towards a conservatory or innovatory function for networks, it is clear that, when networks are seen as shifting and changing, their form may be recognized as appropriate to a rapidly changing society. So it will not be surprising to find network forms espoused later, on an inter-institutional as well as interpersonal basis, as forms appropriate to contemporary conditions—analytic senses (d), social change movements, and (e), general institutional mobilization.

Networks can also be seen, as they have been by authors such as Mullins (II, 1973), as one patterned stage in a series of stages through which movements come together and cohere. Specifically, he suggests, in terms of the development of subject specialties, a movement from normal, relatively isolated forms, to network and then cluster and finally specialty forms. Here we see one idea of progression from relative isolation to some cohesion when ideas are in process of developing and a movement is under way.

A final point to be made is that, in contrast to the theme of nodes with zones moving out from face-to-face relationships to secondary relations, etc., with or without modern media as channels, there is a theme which presupposes distance and assumes that connections need to be made. The very fact of distance means that media of communication, whether people-moving or information-moving, are essential. In terms of the development of patterned stages, here we find that relatively isolated individuals need to be connected and that this can happen informally or through the enhancing interventions of some individual or group which facilitates these connections. The coherence of movements can thus be assisted, as they come and go, by deliberate intervention. Here the question is what kinds of intervention are appropriate and whether it should be kept informal or whether formal institutions can enter the picture. This becomes particularly important when we consider applications to education in a context of social change.

SOCIAL NETWORKS: APPLIED (III)

It is fair to say that social network theorists have not provided many useful results for network practitioners: here, too, there tends to be a gap between research and practice. However, one or two meetings have recently been organized to bring together theorists and practitioners, recognizing the importance of dialogue and the earliness of development of each; and the International Network for Social Network Analysis includes some practitioners.

Some brief suggestive ideas will be offered here.

First is the 'small world' problem research. Milgram (e.g. III (a), 1967) and associates have examined how long a chain of personal contacts would be necessary to connect arbitrarily chosen pairs of individuals in the 200 million population of the United States, irrespective of class, sex and race. They found that, using a procedure of forwarding a booklet with instructions to move it on through strong and weak personal ties to a named target person it took two to ten steps to complete the chains, which were completed in 12 to 33 per cent of cases, averaging between five and eight. This is why strangers who meet and find they have an acquaintance in common say 'it's a small world'. The small number of steps is very surprising: it derives from the geometric nature of the progression and the fact that each step is independent of the previous one. Yet it is clear that, if two people in two populations cannot make contact, no one can. There must always be bridging ties between groups; and few steps are needed.

Bernard and Killworth (III (a), 1977) have more recently discovered that people do not know with any accuracy the extent of their informal social networks and do not remember accurately the extent of their communications with others.

Granovetter (III (a), 1973, 1974) has argued that weak, as opposed to strong, ties permit greater access to information, since the information can then come from many more sources; strong dense ties create more impermeable boundaries. Thus job information, community-assistance information, and specifically diffusion information, are most effective when relying on weak ties and the bridges they provide, since they reach further. Thus, relatively low-energy networks seem to hold promise for more effective distribution.

In his study of job-seeking information chains, the number of steps had to be zero (the prospective employer) or one intermediary if the linkage was to be effective in getting the job. Longer search chains were similar to the use of formal media (advertising) which did not create influence in getting the job. He argues (III (a), 1973):

> The usual dichotomy between 'formal' or mass procedures and diffusion through personal contacts may thus be invalid in some cases where, instead, the former may be seen as a limiting case of long diffusion chains. This is especially likely where information of instrumental significance is involved.

This implies, in the case of libraries as formal diffusion sources, that short interpersonal chains are particularly useful for the acquisition of instrumentally useful information, e. g. citations and references and leads to new work, and reinforces the idea of the importance of social networks, gatekeepers, brokers, etc.

Murray, Magill and Rankin (III (a), 1978) also have found that 'good' information about academic jobs flows through short chains of personal contacts in the midst of a glut of possible formal information sources.

Thus, from one side, random or applied searches from one person to another, by a person looking for some information; from the other side, by some informal or formalized 'clearing-house' such as a gatekeeper or newspaper—these involve networks, their links and chains, strong or weak, ramified and and open or closed. Ideas here are not well developed but very suggestive for further work and analysis.

When we turn to the literature on social networks in education, we find ourselves dealing explicitly, for the most part, not with networks used in a general sense and from the point of view of individuals moving themselves or information or seeking others or some information through one or more steps, but networks in our analytic senses (d) and (e), social change movements and general mobilization, mainly (d). Here, 'networking' is seen as a feasible diffusion and change strategy. Networks bring together relatively isolated individuals and institutions and link them in a relatively loose, non-hierarchical manner, inspire good feelings and solidarity, etc. A key issue is then the power of networks in the face of governments and the ability of governments, or any other formal organization, to intervene to enhance their operation without adversely affecting them.

The United States Government became interested in social networks as a means of bringing about social change after the failure of social action programmes in the 1960s. These programmes, in Schon's analysis, used the centre–periphery model (see below) for diffusion and failed. In their short analysis of networking structures, strategies and characteristics, Cohen and Lorentz (III (b), 1977) are explicit about the resource-saving and consequently greater cost-effectiveness of networks as part of federal government programmes and projects. The basic idea is that by tapping into social movements and intervening to help them get organized, the government (and any organization, national or international) can bring about needed social changes in an effective way.

Several authors suggest role elements that can be played in this type of network. Schon (IV (b), 1971), who is more general and covers possible networks in organizations, between organizations and in overall systems, suggests: systems negotiating (e. g. ombudsman, *tolkach*), 'underground' managing (over jurisdictional lines), manœuvring (to get institutions to cut through institutional lines), brokering, mediating, diffusing, referring, evaluating and managing official networks. Anthony Judge adds value/goal generating/maintaining, researching, interpreting, system-defining, informing, involving, looking out, dealing with emergencies and strategy/policy-formulating.

These can be seen to be elements of activities in networks of a broader generality than the ones considered in this section.

When these latter types of networks come to be considered, one definition suggests that each unit will perform these activities as necessary:

> The network is not coordinated by anybody: the participating bodies coordinate themselves so that one may sopeak of 'auto-coordination' rather than coordination. Similarly, the network as a whole is not 'directed' or 'controlled' by any body, rather it is 'self-directing' and self-adapting (Judge IV (b) 1972).

Such versions of networks certainly exist.

When the facilitation or enhancement of networks is considered, and among many networks in any case, a facilitator/co-ordinator individual or group (the latter called by Goodlad 'the hub', and by Dalin and Kadushin, 'the core') is found. Here the key issue is the degree of centrality that the facilitator/co-ordinator/hub will take. Generally, some degree of co-ordination of functions is considered appropriate, but it should be the minimum necessary. In one of our cases, an inter-institutional networking effort is stalled because the membership rightly consider that the co-ordinator wants to make the network something that he controls.

Eichen (VI, 1977) suggest that networks need both an innovative champion with a conceptualization of 'network' as a form through which innovation may be conducted and a co-ordinator/facilitator, who will perform the types of roles already mentioned. Cohen and Lorentz (III (b), 1977) describe co-ordinator/facilitator skills as follows:

> Basically the role of the coordinator is to bring and keep together people of different talents, to help them grow and develop, to be sensitive to new problem areas that need to be addressed by the network, and to be the scorekeeper. Coordinators, then, need to be group leaders, trainers, bridge-builders (within the network and between the network and outside institutions), and managers. There is room in a network for a variety of coordinators . . . To carry out functions as a generalist the coordinator must be able to undestand the work of several of the specialists.

Clearly, there is no formal training for this type of skill, but the example of the informal technological gatekeeper (above) or formal manager (see Section IV) as well as actual examples of co-ordinators in informal social networks, show that the roles can be performed successfully.

Parker (III (b), 1977), reviewing all the cases of networks he examined, considered the following network properties essential: being an alternative to established systems; holding a sense of shared purpose; sharing information and psychological support; using a facilitator/co-ordinator; and relying on voluntary participation and egalitarian treatment. He found that networks vary in terms of: specific and general purposes; invention, adaptation and replication; 'altruistic' and 'selfish' motives; inclusive and exclusive admission; internal and external financing; geographical spread; and informal and formal structures.

The variations suggested by Parker can be commented on further. Sarason *et al.*, (III (b), 1977) have laid great stress on combining individuals from multiple home bases and from unlike positions in their institutions. Cross-disciplinarity and cross-status flexibility are thereby achieved. It is assumed that social problems and innovations benefit from a variety of participants. Pritchard too (VI, 1977) sought out network members, not by position, but by active interest and from a variety of disciplines and positions in the research/practitioner spectrum. The development of specialties, on the other hand, or of single-issue movements more generally, will lack this feature to a great extent.

The reasons for people joining networks, which may be considered by participants 'selfish' or 'altruistic', are summarized by Parker (III (b), 1977):

1. Information and resources received from immediate *quid pro quo* exchange.
2. Information (and perhaps resources) gained in an unpredetermined manner.
3. Psychological support received in an unpredetermined manner.
4. Positive feelings derived from being part of a special group or 'family'.
5. The opportunity to help others share and learn.

The question of admission is one about which there are arguments. On the one hand, if the participants are to trust each other, some screening seems important; on the other, if openness to new ideas, people and practices is to be maintained, appropriate structural permeability must be possible. Strong ties must not supplant or control weaker ties; otherwise cliques and other relatively impermeable informal or formal organizations result.

The geographical spread variable is of particular interest to Unesco. We find that those authors more familiar with local/regional networks, drawing on the idea of centres and zones radiating from the centres, place considerable emphasis on face-to-face meetings. Those interested in linking far-distant individuals, groups and institutions, not being able to depend on meetings, tend to substitute shaped, useful and trustworthy information, through various forms of media, to link members up. Miles' (III (b), 1975) definition applies here: 'A dispersed structure permitting low-energy access to trusted competence. Appropriate information, energy and other resources can easily be located from physically dispersed nodes to solve local problems.' Personal contacts are attempted around this core, often through travel by the co-ordinator. But transmission media are mainly relied on, usually in the most parsimonious form for resource-sharing, especially in the non-hierarchical network. Hubs and centres are often associated with interventions by governments or other organizations, get more financial resources, and can more easily arrange personal meetings.

The mere sharing of information, involving low-energy access, is often considered insufficient to develop real changes. Apprenticeship, skills-learning and other forms of high-energy involvement are essential. Schon, Goodlad, and others are agreed on this. Dalin (III (b), 1977) mentions the following communication strategies and techniques that can be facilitated in networks: peer-learning through meetings, a process orientation using discussions to maximize transfer, implementation studies and personalized information systems through which members contribute short summaries of their work. Pritchard's network performed this last function and formal systems do it through 'current awareness' services. So a two-level network set may be tentatively suggested: information-sharing and morale-boosting plus training and apprenticeship at a more intense level. This issue is of particular importance for distance-connecting networks and should be examined much more closely.

The variable of invention, adaptation and replication suggests diffusion concerns and brings us to the later discussion of diffusion models (Section V) and alternative versions of structures appropriate for different kinds of dissemination. The issue of internal and external financing is similarly related. In the cases, we find that financial backing varies from essentially a straight barter situation to a multi-million-dollar operation, this variation being connected to the degree of government involvement and the predominance of the to-be-explained centre–periphery model of diffusion. Formal and informal structures indicate both stages of development and outside institution involvement. Whereas most network organizers would not consider formal arrangements in the informal egalitarian spirit of networking, the simple example of library networks as an inter-institutional resource-conserving system shows that the term is still applicable. Whatever the ideology of egalitarianism, actual examples have to be examined for degree of hierarchy and its effect.

In somewhat the same way as Mullins (II, 1973) with developing specialties in science—stages of 'normal' network, cluster and specialty communication patterns—Parker (III (b), 1977) also suggests a series of stages for network development, including decline: (a) isolated innovators and problem-solvers become (b) informal contact networks, which may then become (c) deliberate informal networks; some of these may become or be created as (d) formal networks, which may then become (e) institutionalized, with (f) the spirit finally being dissipated, and (g) new networks possibly emerging from the decay.

Miles (III (b), 1978), reviewing the networking papers commissioned by the National Institute of Education (NIE), focuses on deliberate efforts to create or strengthen networks. He considers that these efforts are possible and suggests five general variables that will influence network strategies: (a) the general 'frame' in which the problem of educational change is being viewed; (b) the implicit view held of the educational system; (c) the type and scale of educational change contemplated; (d) the general type of network being considered; and (e) the anticipated participants and their locations. His paper delineates and articulates to the greatest extent we have yet seen the variations in several dimensions of deliberately created networks in education.

Despite recognition of the importance of social networks, their power in the face of governments has been questioned. Peterson (III (a), 1977), for example, arguing that group theory and network theory overlap, applied a political science critique of group theory to networks:

> If networks are sponsored by the state, they may simply retard the process of social change. If networks must operate within the confines of the larger, more rigid stratification system of the society, then they cannot fundamentally affect that structure. And if incentives must be given to individuals to induce their contributions to networks, then those with the most resources will find networking the easiest. Networking is thus not a viable social change strategy.

The critique by Peterson can be countered by the Schon-type claim that formal organizations seem to be the precipitates of social movements, so that movements for social change in network form are worth encouraging since some of them, in the long run, will be very important.

Schon (III (a), 1977) himself also adds a critique about networks. Modern culture shows a strong faith in the formal service ethic, in terms of structure, organization and planning. This has important advantages over informal networks because it stresses

> perspective, quality, equality, equity and responsiveness of services through the efforts of professional providers who deliver services under formal contact in conformity to standards of performance, for which they are publicly accountable . . . and subject to external control.

Schon's own critique is important but tends to go against his own overall conception of current social conditions. For informal social networks also support the existence of systems against which social change networks mobilize: élites, old boy networks, secret societies, interlocking directorates, etc. The formal service ethic itself has brought forms of discrimination that are hard to eradicate precisely because of these networks that do not in fact espouse the ideology professed. Some of the innovations to be encouraged by networking may in fact be selected because they do promote various social equity goals.

We can conclude this section by referring back to the quotation of Miles at the beginning of this report. It was written by him with specific reference to the material in this section, although we have taken the liberty of generalizing it. What this suggests for Unesco's activity will be dealt with in the final section on recommendations.

NETWORKS WITHIN AND BETWEEN ORGANIZATIONS (IV)

Whatever the formal organization and whatever the formal means for moving information, especially in the form of documentation, between positions within the organization and between organizations, there will always be found informal social networks exchanging information in the form of rumour, reliable and useful information, corner-cutting information to make the job easier, as well as information designed to challenge some formal goal, process or procedure of the organization. Thus, any of the analytic senses of 'network' could be applied; but we shall focus on the last two, which may be particularly supported by the first—transmission media.

In schools and universities, there will be many informal networks of learners, teachers, administrators, and as appropriate, politicians, technicians and parents. These, again, may be thought of as providing the informal infrastructure in which the formal school organization is set.

Much organizational analysis has confined itself to the organization as a unit of analysis, without setting it in a larger context or, as some now call it, 'ecology'. Management studies and organizational development literature and practice have focused on internal relations and their improvement. We shall not review these studies here, since, from the point of view of network analysis, the most important studies are inter-organizational.

Some reference to intra-organizational communication can, however, be made. Allen's work (e.g. III (a), 1977) on information flow in technology laboratory communications has resulted, as already mentioned, in identification of the 'technological gatekeeper'. Mintzberg's (IV (a), 1973) analysis of managers has reached a similar conclusion. The managers he studied performed ten roles in three groups: interpersonal, informational and decisional. The three informational sub-roles were monitoring (receiving and collecting information about the organization), disseminating (transmitting information from the ouside into the organization), and acting as spokesman (transmitting the organization's information into its environment). Through unique access to information and in terms of status, the manager could then play his four decisional roles. Thus, the manager is a gatekeeper with a formal position, obtaining and disseminating information by formal and informal means.

Richards (IV (a), 1975) has developed a programme for the general analysis of communications in organizations; Goldhaber *et al.* (IV (a), 1977) have developed an internal communication audit; Wigand (IV (a), in press) has applied communication analysis to organization for both maintenance production and innovation processes. This work is in its early stages and on the whole does not have specific recommendations for organizations, although it shows promise for the future.

Herbst's book (IV (a), 1976) on organizations serves to introduce also the inter-organizational analysis of authors such as Schon, Trist, Emery, Drucker, Judge and Michael. Herbst argues that organizations, in the face of a modern condition of rapid social change and uncertainty, must adopt a non-hierarchical form that gets away from bureaucracy, if they are to cope with their environment and thus provide management and workers with job satisfaction.

As in social network analysis, so in organizational analysis there has been a tendency to start with the organization as the unit of analysis: here, internal relations are examined. Then, later, the organization and its direct relations (first-order zone) to other organizations, called by Evan the organization-set, is examined. More recently, recognition of further zones as forming an 'organizational ecology' leads to consideration of 'the field of these indirect interwoven relations which constitute the contextual, as distinct from transactional, environment' (Trist, IV (b), 1977). Just as the primary work group is crucial for understanding a single organization, so social networks are crucial for understanding inter-organizational relations. In them interface relations require negotiation among relative equals, while intra- and inter-bureaucratic relations are based on superior–subordinate relations. The removal of hierarchies and their replacement by networking arrangements becomes a major theme of the literature. Centre–periphery models in bureaucracies are inadequate for turning them into open and responsive 'learning systems' (Schon, IV (b), 1971).

Careful programming, solving separate problems and reaching single objectives, especially by throwing increased resources at the problem, are the mark of technocratic bureaucracies and fail to help to deal with uncertainty and social change; they in fact exacerbate the problem. External regulation from above is preferred to self-regulation of the parts, but will fail to be effective.

The solution proposed by Trist and colleagues is to strengthen social organization at the middle level rather than strengthening aggregate controls overall or single organizations (as the primary unit in industrial society). Only in this way can the hazards of inept bureaucratic control be avoided; the middle-level organizations or associations regulate rather than control or produce; they appreciate rather than determine or operate. Here structure is at a minimum and culture joins with modern technologies, which can diffuse innovations with scope and speed. Thus, 'the individual . . . is in process of becoming a network man rather than an organization man' (Trist, IV (b), 1977). The core values here are those associated with organizational democracy, which, clearly, decreases hierarchies' power.

Another approach to current social change (see Judge, Johnson-Lenzes (III (a), 1978) is to see it in terms of complexity. It is argued that social variety is increasing and that it can either be narrowed through government centralization to the point of social or capitalist totalitarianism, or expanded by elaboration and distribution of power and governance in accordance with Ashby's (IV (b), 1958, 1961) Law of Requisite Variety.

DIFFUSION/EXCHANGE OF NEW IDEAS, PRACTICES, THEORIES, ETC. (V)

We have discovered in this literature review that 'diffusion' is a term that naturally suggests itself in relation to informal and also formal networks of communication and information. The information/communication may serve a generally conservatory or normative function, as when rumours tend to support the values of those who transmit them among themselves; or it may be in the service of innovation. In this case, the innovatory values themselves become normative and focus normative activity for members.

Normally, people in their lives are living in more strongly tied or weakly tied networks and are diffusing information through them. Under some circumstances, people become partially or wholly involved in innovatory social networks and are engaged in them in a low-energy or high-energy fashion.

Behind the networks idea stands an idea of diffusion; we are particularly interested in diffusion of innovation since at least two of our analytic senses and part of Unesco's information network activity in education concerns innovations rather than general documentation, which has no particular stance towards innovation.

Some of the applied social network analysis has suggested that short chains involving information movement are also more effective because they include a component of personal influence, whereas longer chains are more like formal systems such as mass media, libraries, information systems, which, even with selection devices such as classification and keywording, are not selective enough and do not also belong to a personal influence network. Influence implies rendering information useful through a winnowing/shaping/evaluating process, including withholding or omitting much that could be relevant.

Managers, key people in technology, politicians, opinion leaders and information brokers are some examples of individuals who play formal or informal networking roles in the diffusion of information which is influential to those receiving it. Networking roles, as we have already seen, can also be analysed into types in general terms, indicating the appropriate skills. Generally, these networking roles are bridging roles in the sense that they provide the only link between two nodes; two liaison people are necessary for a bridge to be created. Most diffusion studies naturally find that personal contacts are crucial; but the literature seems to be able to be divided into innovations that are large or radical and those that are incremental or hardly innovative at all.

The dominant diffusion analysis tradition, represented by Rogers (various citations), assumes that products or other innovations come fully formed and are diffused by a step-by-step process of communication. Schon (IV (b), 1971) argues that this model only works when the spread is of new products/techniques that presuppose a relatively stable technological system of which they are components, or, in other words, when there is a stable, relatively simple message that can be spread uniformly over a periphery. The agricultural extension agent is the classic example of this process and the Coleman, *et al.* (V, 1957, 1966) study of diffusion of a new drug is another.

Among the cases in education, Project Information Packages (PIP) diffusion (Stearns *et al.*, VI, 1977) is a recent example, where the government takes a classic centre–periphery stance. Even in this context, Sieber's (V, 1976-77) critique of practices can be cited:

> There is mounting evidence that the best way to serve the needs both of educators and of enlightened change is to adopt a highly flexible inter-personal approach with a bare minimum of role preconceptions and role props . . . Yet . . . virtually every program for educational innovation . . . relies on . . . a host of . . . conventional managerial practices.

Schon has argued persuasively that innovations that require significant disruption of the entire technological-social system and the system of ideas related to it have to struggle with institutions that employ a dynamically conservative counter-strategy to prevent the innovations from taking hold. More recently Benveniste (IV (a), 1977) has written about these strategies, without, however, examining the role of networks.

In the classic diffusion approach, the Research, Development and Diffusion (R, D & D) model generalizes the assumed top-down diffusion model and tries to apply it even though this is, on Schon's analysis, impossible in a dynamically changing social context.

In the new networking model, the centre does not propose and dispose, form new policy and spread it to the periphery, in our case, communities, localities and practitioner groups; rather, it detects significant shifts at the periphery (communities, localities, practitioners), looks for new ideas coming into good currency and derives themes by induction. Participation, control and autonomy can then be enhanced; actions are differentiated, continually changing and connected.

Here, the key issue is not design of product but design of networks to respond to and diffuse innovations as they arise in as self-transforming a way as possible. The organization of networks demands both a new, flexible structure and development of new networking roles. The role elements have already been mentioned (p. 224). Rather than a 'change agent', a 'learning agent' (individual, group or organization) is needed to make leaps in knowledge, synthesize theory and formulate new models while *in* the situation, through maintenance and development of projective models in some type of memory.

In a continually changing society that is no longer stable, a new model has to replace the normative diffusion theory and the centre–periphery model. This is provided, on the one hand, by the business system firm (developed from the single-product firm), which, by formal networking means, covers a service/product system, such as keeping people in clean clothes, nationally or internationally; and, on the other hand, by the movement of the 1960s and 1970s, which constituted a political opposition to the government and was successful through having no clearly established centre, no stable, centrally established message, taking innovations and diffusing them as they arose and were responsded to, and relying heavily on a telecommunications/travel infrastructure characteristic of the late twentieth century (Schon, IV (b), 1971).

There are, then, two elements in the critique of classical diffusion theory and centre–periphery diffusion organization. One is that most innovations are too disruptive to be diffused by the normal form of diffusion organizations used. The other, more general, one is that the social context of change and uncertainty is so pervasive that the centre–periphery model is unsuitable for all innovation diffusion. Any suitability it might have is limited to minor changes that are non-disruptive and, even so, seem to need the intervention of a 'change agent' operating in as informal a fashion as possible. Generally speaking these agents at the interface of formal systems with informal networks help diminish the relative impermeability of the organizations and help create confidence that the information or other assistance is trustworthy and useful.

Whether it is a matter of social change in a relatively unchanging social structure (analytic sense (d)), or of general social change (analytic sense (e)), social networks seem to be an important if not essential form for diffusion. In terms of structural articulation, as suggested by Mullins (II, 1973), they appear to be a form subsequent to 'normal' weakly tied networks (in the general sense of the term) and prior to clique or other more impermeable forms of association. Paul (V, 1978), looking at inter-institutional relations, analyses forms of networks, with some degree of variation in centralization, complexity and interconnectedness; prior to these stand *ad hoc* interpersonal relations and subsequent to them stand official formal arrangements.

The stronger sense of 'network', related to social change and innovation diffusion, implies a certain pattern into which movements may develop and out of which they may move. The stages of network development referred to in the section on social networks in education (p. 226-7), are stages of network development in the strong sense.

Developing movements, when they reach the network stage, may choose to steer clear of institutional, especially government, affiliation, although they themselves may reach a stage of institutionalization. Several of our network cases in education have done this.

In other cases, governments or other sponsoring institutions may intervene to enhance networks, or may even deliberately try to create them. On the other hand, network facilitation may be achieved without governmental intervention. The Johnson-Lenzes (III (a), 1978) have done some interesting work, using computers to facilitate communication among greographically dispersed networks. They call these 'distributed processing networks', presumably after the physical network pattern they use. These process and make available information about members' interests, mental models, abilities, concerns, and values; and about the extent of the network itself to facilitate development of new relationships, since normally people do not know, with any accuracy, the extent of their networks, or what members have to offer as well as demand.

The argument that the social context for organization is qualitatively different by reason of rapid social change, limitation of natural resources and the uncertainty these and like issues generate, suggests an application to libraries. In so far as they engage in careful programming, pursuit of single objectives by the application of large amounts of resources, and external regulation, they are likely to produce information systems of great beauty and indeed complexity but ones that fail to deal with the multiple needs of 'users' as they shift over time, that is with the complexity of the context in which the users operate.

A more conservative approach would suggest that the innovation-related information services of libraries and their more end-result documentary services should be distinguished, the latter conforming to the classic diffusion model and the former implying the newer model. In this perspective, it remains true that it would be more appropriate to devote computer development to social change-relevant services, to delineate the groups of users and really reach them with information, in the formal sense but with informal interface assistants/co-ordinators, in a flexible and facilitative way.

The issue of 'users' or, in other words, people who live anyway in social networks and are potential social-network members engaging in social-change movements, demands serious attention. It is insufficient, for the purpose of serious change, unless it be change imposed through socialist or capitalist totalitarianism, to connect only government and international-organization bureaucrats and policy-makers through networks, even if those are informal. Since education takes place in communities, learners, community members generally, practitioners and local administrators, as appropriate, are the groups within which networks may be tapped for discovery, enhancement or creation of innovative change that is not minor but major and necessarily disruptive. Networks for social change that avoid governments tend to involve these groups.

Just as libraries may have vested interests in their empire, so researchers may have vested interests in the R, D & D model or at least in the precedence of research. A few network projects, such as the Participatory Research Project (Correia, VI, 1978) attempt to involve communities in their own research so as to help them find out about their problems, prospects and solutions to counter the research of outsiders.

It seems, at any rate, worth suggesting that an examination of different types of network and their appropriateness for different types of diffusion, especially given the type of outside organization involved in creating or enhancing social networks or in developing formal systems, would be well worth while and, as a specific focus for analysis, could yield some very suggestive results.

The two sections of cases: a review

'Network' and 'networking' have become popular terms in the last few years. The citations of cases in the bibliography are, for the most part, very recent. To some extent, the terms have been used since there is a fad for using them. Because of the multiple meanings of the terms already discussed and the tendency to use them as labels rather than in an analytic or even defined way, classifying them is rather difficult.

The difficulty is, as mentioned at the beginning of this report, increased by the relative lack and unevenness of documentation. No citations have been found, for example, on 'how to' organize, build up and maintain a formal co-operative library network. Networks devoted to movements for social change, when unrelated to sponsoring governments or other institutions, may produce material but not on how the network was built and developed. The cases described and analysed by Claman and Parker are useful here. When governments and other institutions, at some stage of the network-building, have a sponsoring relation to them, we find reports, even to the extent of external evaluations. Rather than describing the building up of networks, these reports tend to focus on products, outputs and other forms of achievement.

Since many networks are related to diffusion of innovation, it is possible to review them in these terms, particularly their relationship to governmental or other institutional bodies, the existence of (a) a classical or (b) a social mobilization diffusion model and the related degree of centralization or independence that the nodes display. Here, the physical medium that unites the members can tell us a lot about the degree of egalitarianism in the network. The informality or formality of the network can also be examined in this context. Formal diffusion networks may take the classical diffusion approach, while some may be oriented by recognition of rapid social change and be designed accordingly. Informal networks, including informal interface linkages to formal systems, such as information brokers, technological gatekeepers, etc., may also presuppose either model.

The level of effort of those involved in the network is also an important variable. The low-energy-access networks may represent a weakly tied stage of development of networks, act as a partial resource network in a more intensely tied social movement network, or be a formal network system making available documentary information and disseminating it to users, hopefully on a low-energy basis. When there is a formal organization offering a service in co-operation with other institutions, the arrangement may be for internal-to-the-system resource-saving, or it may be oriented to users as individuals, institutions, etc., operating in a fast-changing world. In the former case, the classical diffusion model may well operate, while in the latter the social mobilization model is likely to be implicit.

In terms of the development of networks, of whatever type, both formal and informal networks may reach a degree of formalization that renders them inappropriately insulated from their social context, and we find instances of this in the cases. However, it would be considered by social change network proponents and by advocates of institutional mobilization in the face of rapid social change inappropriate for such rigidification to take place. Rather, they would advocate the rise of networks to respond to issues and problems and their dissolution when the problems and issues were dealt with. Those performing roles in particular networks would be continually creating and letting go the networks considered appropriate under particular circumstances.

It is not appropriate in this review to go into a systematic analysis of the cases in terms of the variables suggested here as important for a thorough typology. Instead, we shall review the cases in an indicative way with a view towards highlighting some of the issues involved.

Many of the cases can be placed in the library/information network/system type. Some are full systems, while others are more modest attempts to generate reference materials, including directories of individuals and institutions that exist in a field and are in this sense linkable in networks.

Many of the cases can be placed in the social change network type and some have in fact been analysed by Parker (III (b), 1977) within that perspective. As already mentioned, some of these networks avoid government sponsorship or intervention, while others may be created or enhanced by intervention by government or some other sponsoring institution.

Analytic sense (c) of 'network', general informal social network, is naturally found little here. Analytic sense (e) of 'network', institutional mobilization in the face of continual social change and certainty, is one found implicit in many of the examples, but is probably explicit in only three. One is the production of the reference book *Yearbook of World Problems and Human Potential* (Union of International Associations and Mankind 2000, VII, 1976), which is a mobilization reference book produced with the aid of computers and telecommunications drawing information and analysis from all over the globe. The second is the personal linkage system (Theobald, VII, 1977) which is intended to link in a low-energy-access manner those with a common interest in the problems the world currently faces. The third is the United Nations University (Galtung, VI, 1977; The United Nations University, VI, 1975; United Nations University, VI, n. d.): here is proposed an international network of institutions developing task forces to deal with research and implementation on particular problems and issues, and including an information component as part of its services that should be worth examining further.

Returning to library/information networks/systems, ERIC is the main library-based information network with good documentation (Booth, VI, 1975; Burchinal, VI, 1971; ERIC Clearinghouse on Information Resources, VI, 1975; Fry, VI, 1972; among other citations). It involves a network of centres which collect materials and a more centralized set of centres which input them and produce output—reference materials, microfiche, etc. Like CARIS on an international basis in agriculture, ERIC on a national basis in education collects and disseminates mainly 'fugitive' material. It has many strengths. Its limitations are concentrated on means of finding documentation to input, screening material for quality, and failure to reach practitioners at the local level. Sieber (V, 1976–77) comments: 'The ERIC system and other resources do not reach the classroom teacher without the intermediary of extension agents with teaching backgrounds.'

Unesco has an ambitious information/documentation development programme involving telecommunications and computers as network media. In terms of co-operative arrangements, the input/output points are usually organized through Member States' central or decentralized institutions. UNISIST is an overall programme to guide technical, organizational and management aspects. NATIS is a major programme for developing information services in Member States. In the development field, International Information System for Development Sciences (DEVSIS) is a major international network/system.

The Secretariat has developed some necessarily rather modest networking arrangements (e.g. Unesco's *ALSED*[1] *Directory of Specialists and Research Institutions*, VI, 1974) and is contemplating or developing others (e.g. Unesco Adult Education Section . . ., VI, 1977; Unterbrunner, VI, 1978) in the field of education, where an attempt is made to link up individuals and institutions in a particular field, often with publication of a reference directory, thereby facilitating knowledge and permitting voluntary links. These efforts are related to the developing articulation of potential network members on a world-wide basis and seem to remain at the level of directory information, although they could be developed further within the organization.

IBE has, as suggested, two thrusts to its work. The first is documentary and involves publication of newsletters and directories as well as acquisition of materials, training, consultancy, etc. The second is innovation-related and focuses on the development of IERS. This is related to the decentralized Regional Bureaux of Education and their deliberately created networks among member countries for encouraging innovations: APEID for Asia and Oceania; NEIDA for Africa; and EIPDAS for the Arab States. The Regional Offices also offer documentary services (Vaska, VI, 1978).

The development of IERS has been documented to some extent (Unesco: IBE, VI, 1974, 1977*c*. The orientation to innovation is crucial and the production of an awareness list and general newsletter is important. Given the resources allocated to the service, it is important not to have unreasonable expectations. A prior model, the ERIC system in the United States, is supported with far greater financial resources.

One interesting idea in relation to services such as IERS has been developed by the Economic and Social Commission for Asia and the Pacific (ESCAP Secretariat, VII, 1975). Here a network of 'population correspondents' has been developed to increase the input/output interface of the formal network. The East–West Communications Institute has also developed an information network in population and family planning whose organizational features are of interest (East-West Communications Institute, VII, 1976 *a*, 1976 *b*, 1978; Radel, VII, 1975).

The promise and organizational problems of the Regional Offices' innovation networks have been reviewed by Tinsman (VI, 1977). Here, information activities are imbedded in a broader resource-sharing and innovation-diffusing network. A major question is the extent to which intergovernmental formal information/assistance networks can reach the practitioners and communities in which education is taking place. Those who take the institutional mobilization approach—analytic sense (e)—would criticize the organizational diffusion structure as too rigid in the circumstances and would propose other organized network structures. Related to this type of network is Proyecto Red (Bernède, VI, 1977; Gutiérrez Renon *et al.*, VI, 1977; Vaska, VI, 1977), an inter-governmental sub-regional co-operative effort using a systems approach to define, analyse and assist technically, and implement programmes for selected innovations in Central America. It includes a documentation component.

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[1] ALSED: Anthropology and Language Science in Educational Development.

The APEID, NEIDA, EIPDAS and Proyecto Red programmes involve narrowing the range of possible topics for innovation by a process of agreeing on which are the most important, at the governmental level. This is a useful screening device, comparable to the screening of material for ERIC and other systems and the screening of innovations in the National Diffusion Network (see below). In the first case, the goals are screened, in the second the documents, and in the third the innovations themselves. The latter two cases are general systems; the first case is focused by field. Focus by field also characterizes single issue movements, information centres covering a single or delimited field and single topic research networks, as compared with resource networks that cross-cut topic boundaries deliberately or networks of people in similar positions with a range of problems.

Two of the information networking programmes funded by USAID, the Non-Formal Education (NFE) Information Center (VI, 1977*a*, 1977*b*, 1978) and the Information Center on Instructional Technology (Information Center on Instructional Technology, VI, 1977) are essentially resource centres in sub-fields of education of interest to developing countries. Here, newsletters and mail responses to individual requests, with the assistance of SDI services, are provided. In these three programmes, the members of the network are not interconnected but are connected to a centralized hub and are therefore dependent on it.

Non-government organizations are interesting in the context of diffusion and centralization. Reconceptualized by Judge and Skjelsbaek (IV (b), 1972) as 'transnational association networks', many of them display organizational decentralization of the network type. In this connection, the information services of the International Planned Parenthood Federation (Dennis, VII, 1974; Forget, VII, 1976*a*, 1976*b*, 1978; Unesco, VII, 1974) are worth examining. In the field of education, IMTEC (Dalin, III (b), 1977, VI, 1976) adopts an explicit co-operative organizational form, with a hub to facilitate development and maintenance of various sub-networks.

The Central Bureau for Educational Visits and Exchanges (VI, 1977) is a decentralized governmental bureau that acts as a broker for individuals and institutions interested in starting up network activities or otherwise being connected. This demonstrates that, in a government bureaucracy, the role of broker can be played within fairly broad limits. Among international organizations, the Development Education Exchange Service (Development Education Exchange Service . . ., VII, 1975) is another example of a far more co-operative effort than might otherwise be expected in the institutional setting.

NEXUS (NEXUS, VI, 1976) seems to perform an information broker function through a single medium—the telephone. Questions are phoned in on a free-charge nation-wide phone line and answers are prepared, immediately or with the assistance of a network of volunteer experts in a short time.

We have previously referred to research communities, especially in science and technology, and material on how new information is disseminated in them. Here, informal networks play an extremely important role, just as informal networks on new information do in other communities. Several of our cases involve research and can briefly be covered together. Among the formal systems, ERIC, IERS, etc., include progress and final reports on research. From the other side, the Participatory Research Project of the International Council for Adult Education (Correia, VI, 1978) organizes research at the community level on the part of those involved. For individuals and institutions, the Unesco Institute for Education (Carelli, VI, 1978) is developing a promising network, while the University of California at Berkeley (Pritchard, VI, 1977) ran one for three years. The International Development Research Centre (IDRC) is developing a fairly closed but very interesting hub for the examination of educational research (International Development Research Centre, VI, 1977), which intends to consider substantive areas as well as the diffusion process. *Resúmenes Analíticos en Educación* is a low-cost product of a networking effort in Latin America to diffuse research rapidly.

In the United States, ERIC, already briefly described, is a research dissemination network/system. It is an alternative, more comprehensive and much more expensive means of diffusing information than, say, *Resúmenes Analíticos* or the Berkeley network, through which researchers can be more directly connected and with less access problems.

Other dissemination efforts are government-sponsored. They include that of diffusing project information packages of educational innovations to classrooms throughout the United States (Stearns *et al.*, VI, 1977). This follows the classic diffusion model; of six innovations, the five most successful ones were those non-disruptive to the school system, being essentially new products that could be introduced without basic disturbance. The National Diffusion Network (Emrick *et al.*, VI, 1977; Hall and Alford, VI, 1976; Neill, VI, 1976; Parker, VI, 1977*b*) is well-documented and has done far better than it was expected to do. It even survived a gap of several months of federal funding and was kept together by the enthusiasm of its members while they successfully lobbied with Congress for its restoration. It disseminates innovations that are more in the nature of services, such as teaching approaches, than products. On one side stand 'developer-demonstrators', whose innovations are screened by a government committee. Those approved are disseminated partly through individuals on the level of the states, known as 'facilitators', as either adoptions or adaptations. The developer-demonstrators are available for consultation by adopters, who like the wide range of innovations offered, and appreciate the developers as, for the most part, practitioners like themselves. Here, the connection of practitioners with practitioners who have innovated seems of particular importance in view of the frequently expressed gap between research and practice. This model is well worth examining, both with regard to this aspect and with regard to how it fits with the classical and social change diffusion models. *Dissemination Networks: Information Resources for Education* (VI, in press) provides details on a wide range of federal dissemination programmes in education in the United States.

Diffusion through inter-institutional connections is resource-saving for those who participate. The inter-institutional connections may be formal, or more informal, as with state-level facilitators in the National Diffusion Network.

Smith (VI, 1977) and Rosenblatt (VI, 1976) present a further case-study of an inter-institutional deliberately created diffusion network, in the field of aesthetic education, discussing the process and problems involved.

The most interesting network at the interface of governments and social change movements is the Teachers' Center Exchange (Devaney, VI, 1974, VI, 1975; Teachers' Center Exchange, VI, 1976, 1977) and there is considerable information available about it. The teachers' centre movement, whose goal is to provide a practitioner-run resource-sharing low-cost centre in local districts to which teachers can come for self-renewal and new ideas, was facilitated by the government by the creation, on neutral ground, of a centre for enhancing local and scattered efforts, through an advice service, production of documents and more occasional work, and training sessions, etc. This seems to have worked well too for this particular innovatory movement, which does not espouse a single ideology, unlike the Individually Guided Education movement (see below), but is for more general renewal purposes.

The social change-related networks are typically decentralized and relatively non-hierarchical in structure. Some are people starting a new approach to teaching and looking for mutual support (e.g. Change in Liberal Education, VI, 1978; Claman and Parker, VI, 1976*b*; Parker, VI, 1976*b*). These are single-purpose networks, rising and falling as innovations are accepted (e.g. Parker, VI, 1977*a*) or as problems are resolved, as will happen normally if the networks are not institutionalized.

The resource-sharing network in this context often cuts across subject and status lines in pursuit of a deliberate strategy of solving problems on an inter-institutional cross-cutting basis (Eichen, VI, 1977; Parker, VI, 1976*c* Sarason *et al.*, (III (b), 1977). The idea of joining in networks those who are prepared to put in their contributions, irrespective of position, is an important one (Pritchard, VI, 1977). Energy and commitment are crucial.

Other community-level networks that have been organized include the national Parent's Network, which as part of its activities acts as information broker on matters of importance to parents (National Committee for Citizens in Education, VI, 1978), the Educational Confederation, a local organization in network form that cuts across agencies, statuses and subjects (Educational Confederation, VI, n. d.) in a way somewhat similar to the resource networks (Sarason *et al.*, III (b), 1977) and, presumably, the thousands of local informal student networks that provide mutual support and mutual encouragement for learners!

Other networks connect those in similar positions in agencies or organizations who need support and discussion for dealing with common problems that each has to face separately (Merrow, *et al.*, VI, 1974; Parker, VI, 1976*d*). The problems are varied but the position is similar.

A brief summary of stages of development of networks and of network roles and facilitator/hub properties has already been presented, and this will not be repeated here, except to quote Goodlad (VI, 1977) on the function of his hub:

Informational input regarding extant innovations and potentially useful products, annotated bibliographies, assistance with problem and resource identification, participation in a leadership training program, organization of meetings and conferences, and so on.

It is not possible, on the basis of information available, to give a comparative analysis of costs of networks of different types, including various sources for funding, but with further investigation this could be done.

This brief survey of cases of networks is at the indicative level. With further examination and analysis, it would be feasible to produce a comparative study, focused on issues of particular concern, in the way Parker has done for social change networks.

Recommendations to Unesco

The main purpose of this analysis has been to achieve a broad and overall perspective on networks through which information, in whatever form, passes that will be useful in the context of education. The development of the analysis has reached the point of indicating where Unesco might be interested in further investigation by the posing of more specific questions and the examination of more particular areas. This, in general, would seem to be the next stage.

Basically, it would be appropriate for Unesco to consider what areas it wishes to examine more closely and to concentrate on analysis, examination of cases and development of programmes in these areas.

With respect to library/information networks, there are several important issues:

To focus further on the question of users, the form in which they need information and the best means of delivering it to them.

To examine the formal system/informal network interface by looking further into such intermediaries as information brokers, gatekeepers, and others who may actively guide and assist users.

To investigate further the informal networks through which STI and other information flows in a useful form, including the best length of information chains, the extent to which sub-networks can be developed through key individuals, etc.

To consider the most appropriate form and delivery system for innovation-related dissemination, especially low-technology networks that could be set up and let go of in a considerably more flexible manner than formal networks; such networks might find suitable bases for their hubs in many parts of the Unesco structure.

To compare library networks with the news media to discover to what extent outreach can be improved and what lessons news organizations may have to offer, particularly with respect to inputting information and employing strategies and tactics for diffusion, in a fast production cycle, to a wide audience.

Behind these issues stands a more general one about the organization involved, its structure and its model of information and its diffusion. In this connection, the following issues could be addressed:

To investigate more carefully and in more detail the variation in institutional arrangements and ways in which any particular pattern may be appropriate for information network.

To consider in more detail the issue of centralization and hierarchy in networks of the various types, particularly the influence of the physical network shape on the members of the network and the degree to which centralization can be introduced into a social change network.

To evaluate the two models with which innovation-dissemination can be approached and consider where each is appropriate and what consequences this has for network design or network intervention.

To investigate possibilities for connecting with social change networks, as the United States Government has done, at the international, regional and national levels. In some of Unesco's Member States, co-operative networks exist at the community level and might provide some suggestive illustrations for government–community connections. On the international level, non-governmental organizations, or transnational association networks, have been used by Unesco in several activities, e. g. the development of computerized information networks. Other association networks, e. g. teachers' associations, might be worth investigating for possible decentralized information activities.

It would certainly be worth while comparing in greater detail cases of networks of the library/information centre type and of the social change type, with respect to the variables brought out earlier in this paper, such as organization, stages of development, formality/informality, low-energy/high-energy, centralization/egalitarianism. More specific questions related to Unesco's mission and goals can be asked.

Another interesting framework from which to analyse different types of information networking, both formal and informal, is from the point of view of the different patterns of procedures for finding, screening, processing, storing and diffusing information in different types of networks. By doing this, it should be possible to discover in further detail some of the general process features of the different types and, in relation to these features, which are the most resource-saving network types to use in particular instances.

The general issue of generation, exchange and dissemination of research information is clearly one that can be investigated more systematically, with more specific recommendations for network development than can be given here. But in this connection, investigation should include the involvement of practitioners and communities, as sources, as networkers of social change information and as 'researchers' in their own right.

Examination in further detail of networking role elements and network-type roles such as broker, gatekeeper and facilitator, particularly in relation to government and formal system interface, would be of great importance. Such roles seem to be an appropriate development from consulting roles, currently in something of a decline in international circles. It may even be possible to develop and tailor some role or set of roles for specific use by the United Nations family. Sufficient experience exists and Unesco could act as a catalyst, both by producing information on networking roles and drawing on consultants who have the experience and themselves are well-connected with networks in various sectors.

The issue of costs of various forms of network, at various stages of network development, could be investigated with more precision on the basis of information available in this bibliography. Since scarce resources and resource-sharing are important for Unesco and its Member States, this issue is of considerable importance.

In conclusion, it is worth stressing an important fact about well-conducted networking efforts that has perhaps been under-emphasized in this report. Networks, particularly when they are low-hierarchy and egalitarian, bring out considerable enthusiasm and commitment among their members. Members are exchanging and contributing instead of being told what is good for them. In a resource-sharing world, where people and institutions are widely scattered and may feel overwhelmed by the needs they are unable to fulfil, the implications of this are great and need to be taken extremely seriously.

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17 International information networks and their role in the transfer of educational experience[1]

International Bureau of Education

Introduction

The selection of the special theme of the thirty-sixth session of the International Conference on Education reflects an increasing recognition that national self-sufficiency in educational experience is not realistically attainable. International co-operation for information transfer in all fields, including education, is indeed an essential aspect of national development for which international information systems based on a network structure are proving to be one of the most fruitful approaches.[2]

It is therefore appropriate to review the present situation of these networking arrangements and to derive conclusions from experience before turning to the problem of educational information at the international level.

The international community is now fully committed to the establishment of a new economic order in which mechanisms for international exchange of knowledge and experience are recognized as a priority.[3] It is in this atmosphere that a full family of compatible international information systems is now developing in the UNISIST conceptual framework endorsed by the United Nations system; in all, about thirty-five specialized global information networks are either operational, under development, or planned at the present time. Although the first operational networks have covered scientific and technological information, the network concept is rapidly being extended to other fields.

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1. This paper was originally prepared for the Thirty-sixth International Conference on Education (Augusts/September 1977, Geneva, Switzerland).
2. Although strictly speaking an information system need not be based on a network structure, the expression 'information system' and 'information network' may be considered as essentially interchangeable in the present treatment of international information exchange.
3. See resolutions 3201 (S-VI), 3202 (S-VI), 3362 (S-VII), 3507 (XXX) and 183 (XXXI) voted by the United Nations General Assembly.

EXISTING INFORMATION NETWORKS WITHIN THE UNITED NATIONS SYSTEM

The first and perhaps best known networks within the United Nations system have been designed to provide comprehensive information on published documents in specialized scientific and technological fields. As will be seen through the examples of the International Nuclear Information System (INIS) and the International Information System for the Agricultural Sciences and Technology (AGRIS), such bibliographic networks are true international co-operative ventures, providing equal access to information to all participating nations and at the same time requiring the active participation and support of each.

INIS, which commenced operations in 1970 under the auspices of the International Atomic Energy Agency (IAEA), is a network of national atomic energy agencies each of which assumes responsibility for indexing and abstracting nationally produced information on nuclear energy. The INIS centre in Vienna processes this information and provides the world's single comprehensive abstract service in this field which, in addition to its direct use by scientists and engineers, forms the basis for national information query services. IAEA is able to provide copies of documents at modest cost to participating national centres, ensuring universal access to information identified by the network.

AGRIS, which first became operational in 1975 under the reponsibility of the Food and Agriculture Organization (FAO), differs from INIS in that it strives to identify the world's agricultural literature by author, title and subject field but does not yet provide for abstracts or delivery of documents. Complete services will be implemented gradually, as the member nations, often developing countries, acquire the capability to process and transmit the required information. A second difference between INIS and AGRIS is the regional approach characteristic of AGRIS. There are at present four intergovernmental regional AGRIS centres which co-ordinate national input of participating countries, and at the same time provide a basis for development of regional services.

In reviewing bibliographic-type information networks, one should also note the INPADOC system for patent information under the auspices of the World Intellectual Property Organization (WIPO), fully operational since 1974, and the International Serials Data System (ISDS) which was officially inaugurated with Unesco assistance in 1976. ISDS is a comprehensive register of the world's periodical titles, the principal users of which are other information systems at the international and national levels.

Bibliographic information networks such as INIS and AGRIS are now being followed by other classes of network at the international level. The CARIS current awareness service covering information on ongoing research in agriculture is complementary to that of AGRIS for published information. Data submitted by national input centres on ongoing research projects are stored in computer-based files at FAO. Services being implemented in 1977 include directories of research and computerized information searches from the four CARIS files (research projects, programmes, institutions, workers).

The United Nations Industrial Development Organization (UNIDO) has developed a different network approach. Its Industrial Clearing-house provides information to national decision-makers and technical personnel, acting in co-ordination with the UNIDO development assistance programme in the field of industrial information. Services include free response to inquiries on problems in industry, referral to sources of appropriate technology where full information is not immediately available, and announcement of new developments and sources of information through a newsletter and other publications.

INFORMATION NETWORK DEVELOPMENT IN THE SOCIAL SCIENCES

The application of the network concept to information exchange in the social sciences has generally lagged behind advances in natural sciences and technology. The larger quantities of information in the latter fields and the high priority which has been accorded to science and technology have been factors in spurring this development. In addition, the considerable heterogeneity among Member States in the conception of social sciences has slowed perception of the need for information exchange in these fields. Thus, in spite of the fact that the organizations of the United Nations system have successfully applied automated information techniques to bibliographic information in the social sciences for more than ten years, true international networks have been given serious consideration only recently, with the coming of awareness that science and technology provide only a part of the information needed for overall development. Several information networks with broad interdisciplinary missions covering major social and economic objectives are at present in the planning stage within the United Nations system.

ILO provided an early lead in this process by developing the ISIS computer programs (now in widespread use for information work in all fields) to store and retrieve bibliographic information on its extensive library holdings related to labour issues. Regular services of the ILO library, for which about 50 per cent of the requests emanate from member States, include computerized literature searches and periodic information on new publications based on user profiles. Unesco and the Dag Hammarskjöld Library of the United Nations are developing similar services including social science fields within their respective competence.

The DARE computerized data retrieval system of Unesco, in operation since 1972, covers both information on ongoing research and bibliographic information, emanating from an international network of more than 2,000 research institutions in the social sciences. Information retrieval services are currently centralized on the Unesco computer, but it is anticipated that Member States will develop their own services based on DARE magnetic tapes in the near future.

A feasibility study for DEVSIS, an information network for the development sciences, was completed in 1976, under the sponsorship of several international agencies (International Development Research Centre (IDRC), ILO, OECD, UN/ESA, UNDP, Unesco). The scheme proposed is that of decentralized input and centralized output as in INIS and AGRIS. However, services would be twofold in nature: (a) a bibliographic service to index and abstract the approximately 100,000 documents with direct relevance to development (about 20 per cent of which are produced and already covered within the United Nations system) and (b) a referral file of institutional sources of development information. Contrary to INIS and AGRIS which are at present limited to English-language services, the use of three carrier languages (English, French and Spanish) is foreseen. The system, if implemented, will probably come under the responsibility of the Department of Economic and Social Affairs of the United Nations (UN/ESA).

Other networks with social science implications being considered in the United Nations system include SPINES for management and policy-making in science and technology, POPINS in the field of population and several proposals in the field of human settlements.

REGIONAL INFORMATION NETWORKS

A survey of international information networks would not be complete without some discussion of networks of less than global participation. Global information systems such as those developing within the United Nations system provide equal access by all countries to information but are also limited by the possibilities of all participating countries to contribute. The regional approach permits pooling resources for more rapid build-up of network capability within a given region which can become, as in the case of regional AGRIS centres, a valuable link for inter-regional information exchange.

The Economic Commissions of the United Nations are working towards the objective of developing regional information networks in covering social and economic fields and associated technological questions. The CLADES Documentation Centre of ECLA, set up in 1971, provides documentation services and promotes information exchange in Latin America as well as furnishing technical assistance to participating national information centres; the Asian Development Institute sponsored by ESCAP is developing the basis for similar co-operation in that region. Both regional networks are conceived so as to be ultimately integrated into the DEVSIS system if it indeed becomes a reality.

Finally, information networks of a regional character which are not formally linked to the United Nations system deserve mention in the present survey, from the point of view of models with potential for wider international exchange.

In Western Europe, the Space Documentation Service (SDS) of the European Space Agency (ESA) provides an example of an international information system based on the advanced technology of on-line information retreival. While previously mentioned international networks group essentially producers of information, ESA provides multidisciplinary coverage using existing information from several commercially available magnetic tapes services, covering engineering, physical and environmental sciences and providing almost 6 million references as of the end of 1976. The files are searched to provide bibliographies and current awareness services on a fee recovery basis. The essential difference for the user between the service of SDS and that of INIS or AGRIS is that SDS output is decentralized by virtue of remote terminals in participating countries and access of individual users to the files through ordinary telephone lines. SDS service has recently been extended outside the European region to Morocco, and has led to increased consciousness of the potential for on-line information transfer in Europe itself, a potential which is being realized through the EURONET telecommunication network in which ESA/SDS forms an information link.

A second and quite different model for a regional information network is that of the International System of Scientific and Technical Information of the member States of the Council for Mutual Economic Assistance (CMEA). This system is being gradually established on the basis of a Draft Plan envisaging co-ordination of national information systems of member States and development of international subsystems with specific missions, in co-operation with the International Centre of Scientific and Technical Information (ICSTI), an autonomous international body created in 1969.

The activities of this centre, reflected in its statutes and the formal agreement between it and CMEA, encompass: (a) information services, including an abstract journal covering reports and dissertations in all fields of science and technology in all participating countries; (b) research and development on information problems of common interest, such as the application of teleprocessing and telecommunication; and (c) organizational and technical assistance to the participating countries as well as assistance in the education of information specialists.

Within the framework of the ICSTI programme, preparatory work has been completed for several international discipline-oriented subsystems in scientific and technical information covering such fields as chemistry, electrotechnology and agriculture. To ensure compatibility among the various national information systems and the specialized subsystems which will ultimately be integrated within the CMEA network, the centre is also active in the field of standardization.

GENERAL NETWORK CHARACTERISTICS

It is important to note that the above information networks, as well as international networks for exchange of educational experience considered below most often share a common organizational framework; they are systems in which member States are not passive clients but are active participants in the gathering, processing and dissemination of information. Although details depend to a large extent on the objectives of a particular system and the resources available, the general organizational scheme can be summarized as follows:

Each participating member State, through its national institutions, is responsible for identification and collection of information produced within its borders, and for the selection of information to be transmitted to the international system.

Information received by the system is processed and made available equitably to the participating member States through a mechanism under their common control, typically entailing an international governing body.

Each member State, again through its own institutions, selects the information it needs from the system, and is reponsible for dissemination and use at the national level.

There has been strong justification for use of this approach in developing international systems for information exchange.

Firstly, political support of participating nations is facilitated by adoption of such a framework which is based on equity. Each participating nation oversees the use of information produced within its territory; on the other hand, all information entered into the system becomes freely available to all participants.

Furthermore, the division of labour and responsibility in handling information often leads to lower costs. In the international context, there is the added advantage that the share of participating countries in system operation is paid to a large extent through national activities, rather than in currency.

The same division of responsibility can naturally lead to better and more efficient information handling. In the context of an international system, where each country selects and processes information produced within its borders, there is virtually no possibility of the same unit of information being submitted, classified and sorted more than once. In the same manner, an international network can be the best solution to the problem of multilingualism, since a country producing information in a given language is often best equipped to process such information, that is, to select, classify and translate it, if necessary, for entry into the system.

The existence of a family of compatible international information systems permits efficient participation by each member State in several international systems, chosen in consideration of total national needs and resources in information. The total cost of such participation can be monitored at the national level, and reduced through appropriate decisions. National standards and procedures can be adapted to a number of international networks without waste. Finally, each country can develop a national programme to develop capability to collect, store and disseminate information in keeping with both its indigenous and international needs through training, common services and institution-building.

Co-ordination of information flow at the national level has been seen to be of primal importance both in national development and in international information exchange. Many countries have officially established a national co-ordinating body (focal point) within the UNISIST framework to supervise the above policy and development aspects of the national information system; the role of Unesco in encouraging this process will be outlined below.

USER NEEDS AND EXISTING RESOURCES

The most fundamental questions to be answered in considering an international network are: who are the potential users of the system and what are their information needs? and what resources are already available in the form of existing information services? The scope of the information needs will determine to a large degree the subject scope and services of any future network. The existing institutions and services will often serve as a starting-point for the development of network services, or suggest the best sequence of development. These questions are normally answered by surveys of information needs and resources, either preceding or included in the feasibility study on the establishment of a new information network.

The principal problem in carrying out an accurate user survey is often that of distinguishing real information needs from expressed or assumed needs, especially when considering persons who are not habitual users of information services. The persons who have the greatest need for information (judged, for example, from the viewpoint of national development objectives) may be difficult to contact, requiring carefully structured interviews with critical analysis of the data given. Similarly, a credible survey of existing information services should examine their real capability in reaching the users, as opposed to desired or claimed performance. Thus the problems of surveying needs and resources are interrelated; the existing information services are often in the best position to study the needs, and the viewpoint of the user is essential in surveying the existing resources. The active participation of experts with detailed knowledge of the countries or regions concerned is often an advantage in overcoming the above problems and in improving the ultimate credibility of the results obtained.

POSSIBLE NETWORK SERVICES

Before proceeding to a discussion of the steps in planning an information network as a function of information needs and resources, it may be helpful to briefly review the main types of services which may be envisaged. The services which follow are arranged in an order roughly indicative of increasing complexity of information treatment by the network in adapting the information to the needs of the user:

Referral services do not directly furnish the information required by the user but rather refer him to appropriate sources of information (typically other information services).

Bibliographic services furnish secondary information on published documents (which may well include non-textual forms such as recordings or films) enabling the user to locate documents of interest to him and to learn of their contents. The most common forms of bibliographic service are provision of information to solve a precise problem (specialized bibliographies) or periodic dissemination of new information in a field of interest to the user (current awareness service).

Document delivery services provide the full content of a document to the user, either in original or reproduced form.

Ongoing research information services can provide information on recent innovations and on research projects in progress, before appropriate published documents are available.

Numerical data banks provide statistical or other numerical data.

Information analysis services evaluate information within a relatively specialized field in terms of its significance and accuracy, and make available the results of such analysis as consolidated or 'repackaged' information.

'Question and answer' services (inquiry services) provide rapid personalized responses to specific inquiries through the intermediary of information staff with access to appropriate resources in information.

Extension services seek out information problems of users who do not normally employ the preceding services, and provide suitably repackaged information for their needs.

It has already been seen that the various types of information service are interdependent in practice, and that several services are often incorporated into the same network. An additional service not listed separately is translation, which must naturally be considered in relation to any of the above services when problems of multilingualism are posed.

THE NEED FOR A FEASIBILITY STUDY

The optimal structure of a given information network depends on political, financial and technical considerations, as well as on the mission of the network. A necessary basis for development of an information network is of course political—a willingness of a number of nations to co-operate in a given field. Once co-operation is agreed on, in principle, financial limitations, that is the quantity of resources the participants can devote to the network, are of primary importance. Finally, technical considerations will influence the organizational structure and the extent and quality of services to be offered, within the basic political and financial constraints.

A feasibility study under the responsibility of an international body grouping the prospective sponsors is the mechanism typically chosen to weigh the various factors outlined above (mission, political and financial support, technical feasiblity) and to propose the detailed structure of a network and the timetable for its implementation. Such a study is most often carried out by an international expert team encompassing the different disciplines and approaches needed, i.e. representing the viewpoints of both the users and experts in system design and implementation, as well as those of the various governmental or institutional sponsors.

The duration of the study and size of the team required (corresponding to perhaps several man-months or several man-years of effort) will depend on the complexity of the planned network and the data already available.

The final recommended structure of the network will naturally vary greatly from case to case. In the previous sections, the examples have been chosen to illustrate various possibilities of network services, as well as two fundamental choices in network design: the global approach versus a regional approach and the degree of centralization versus decentralization in network activities. The following brief section will attempt to summarize some general conclusions on network structure and organization.

FACTORS INFLUENCING NETWORK DEVELOPMENT

As has been seen in the examples given, an international information network is a complex institution which can only be fruitfully developed over a significant time period and on the basis of a precisely defined mission and plan. Clear success cannot be said to have been achieved until the entire chain for transfer of information has been ensured—from the sources to the data base and from the data base to the final user.

Regardless of the services provided, it is rare that an information network or programme can be said to be truly perfected at the international level because of the extremely complex tasks involved. Continuing development of various parts of the structure in response to planned priorities or to continuing evaluation is rather the rule.

The question of the degree of centralization versus decentralization to be adopted is of particular importance to the design of most information systems, and the advantages and disadvantages of both must be carefully weighed in each case. In the preceding discussions, it was the advantages of decentralization that were perhaps most emphasized, since these factors are fundamental to the concept of international co-operation. However, cost-effectiveness and other technical considerations may require the introduction of substantial centralization into the structure of a network. The cost of computer resources or the availability of computer and telecommunications technology may lead, for example, to the adoption of either centralized or decentralized computer facilities for data handling. Similarly certain network functions, such as management or training, may be centralized to a considerable degree for reasons of efficiency.

As has been implied in the examples in this chapter, centralization is often more appropriate at the regional level than at the global level for both organizational and technical reasons. In viewing a network or programme for improving global information transfer in a given field, full account should thus be given to existing and potential regional structures.

For an international information network requiring both complex organization at the international level and a comprehensive collection effort at the national level, such as is the case with INIS or AGRIS, the following points are especially relevant:

Considerable costs may be involved. The annual cost of AGRIS at the international level approaches $1,000,000 and the contribution in effort at the national level is estimated to be roughly equivalent.

A time-lag of about five years can be expected to elapse between initial planning and commencement of operations of an international network such as AGRIS.

Establishment of a comprehensive international service identifying a class of information does not in itself ensure fulfilment of the chosen mission. The ultimate utility of a bibliographic network, for example, hinges on the potential of participating national information systems to provide useful output services such as document delivery or extension services.

The above considerations do not negate the proven success of international bibliographic information networks. They indicate, however, the possible advantage of a less highly organized service, such as an international referral service, as a first step in development of a network, and the need to support member States in the development of their national capabilities in conjunction with establishment of international information services.

NETWORK DEVELOPMENT AND INTERNATIONAL NORMS

The organization of information transfer must be considered in terms of overall trends and policy at the national and international levels, as well as the unique aspects of any given network. In this context, standardization of information-handling methods and common training practice are the most important elements in permitting exchange of information between networks.

Adoption of common technology and equipment by different networks can result in considerable cost savings. One can point to use of the same central processing unit and computer programmes by both INIS and AGRIS, and the widespread usage of the ISIS programmes (developed by ILO and improved in co-operation with Unesco) both in the United Nations system and by national institutions. In the social science field, ISIS is in use by IBE, ILO and Unesco-computerized documentation services, as well as the DARE system covering ongoing research.

Adoption of internationally recognized norms in form and content (documentary terminology, exchange formats for information, etc.) within individual information networks may be even more important than technology in preventing extensive restructuring efforts when sharing of information becomes desirable.

Finally, development of training of information professionals—documentalists, librarians, systems engineers, extension officers, etc.—along common principles contributes to the ultimate utilization of common methods and standards. In this way training may also be regarded as a common service to all information systems, resulting in substantial savings when implemented in common at the national or international levels.

The purpose of this section has been to demonstrate that the development of specialized information systems is founded on common principles and methods. The following pages outline the services available through UNISIST and the Unesco programme which contribute to the development of individual information networks and to co-operation among information systems in the priority areas of standardization and training.

The role of UNISIST and the Unesco General Information Programme in development of information exchange

NATURE AND OBJECTIVES OF UNISIST

The long-term Unesco/UNISIST programme for co-operation in the field of information, based on a feasibility study by Unesco and the International Council of Scientific Unions (ICSU), was formally initiated at the seventeenth session of the General Conference of Unesco in 1972 in order to promote the establishment of a flexible world network of information systems and services based on voluntary co-operation and to facilitate equal access to information, especially by helping the developing countries meet their information needs.

Although initial programme activities emphasized information transfer in the natural sciences and technology, attention has been given from the inception of the programme to ensuring the appropriateness of the UNISIST framework to the social sciences. Originally identified with the Unesco Science Sector, UNISIST has been implemented since January 1977 within the intersectoral Unesco General Information Programme.

Programme activities will be briefly described in the next four sections in terms of: policy and planning in the information field; development of information-handling capability; norms and standards for information exchange; and training in the information field.

Under each heading, guidance is available both for development of global and regional information networks and to Member States to strengthen their national capability to profit from international information exchange.

POLICY AND PLANNING

At the international policy level, Unesco participates in consultations and promotes study on information networks to help ensure the use of proven techniques and efficient structures. Unesco/UNISIST participates in the advisory organs of established systems such as AGRIS and systems in the planning stage (DEVSIS, POPINS, SPINES, etc.) in its capacity as the only information programme within the United Nations system of a general nature designed to provide a conceptual framework for information system development.

At the regional level, working contacts are maintained with existing information networks and programmes such as those of CMEA and of the European Communities which are considered effectively as regional links within the UNISIST framework. Where general regional co-operation in the field of information is not yet formally and effectively established, meetings of governmental experts on regional information policy development are sponsored to promote dialogue and to help establish conditions appropriate to the development of regional activities. Two meetings held in the region of South and Central Asia are expected to facilitate concrete programmes such as a regional data bank for technology transfer, while a meeting of Arab States' governmental experts recommended a general framework for regional development of information exchange, which has subsequently been ratified at the ministerial level Conference of Ministers of Arab States responsible for the Application of Science and Technology to Development (CASTARAB), 1976). Similar consultations are scheduled in other regions.

At the national level, liaison with the Unesco programme is ensured by national information focal points and UNISIST national committees already established in fifty-five Member States. A focal point is defined as the national agency responsible for co-ordination of overall information policy including national participation in international information networks. The national committee for UNISIST is a consultative body to advise the government on all aspects of information exchange and on liaison with the Unesco General Information Programme.

In order to promote development of national information policy, guidelines and assistance are made available to Member States upon request. In addition, meetings of representatives from all regions are organized periodically for the exchange of views between developed and developing countries and the establishment of a basis for the evolution of international information exchange.

In its efforts at the national level, the Unesco General Information Programme is closely associated with discipline-oriented information programmes within the United Nations, organizations concerned with strengthening national capabilities. An example is the agreement between Unesco and the United Nations Environment Programme (UNEP) to help promote close co-ordination between national information focal points and the environmental information focal points of the United Nations Environment Programme/International Referral System (UNEP/IRS).

DEVELOPMENT OF INFRASTRUCTURE

Direct support is provided by Unesco to initiate international infrastructure designed to solve information problems of a general nature. In the field of numerical data, a long-term programme in co-operation with ICSU includes establishment of the World Data Referral Centre, as one link in the ultimate UNISIST network of international referral services. The International Serials Data System (ISDS) is another example of a Unesco-sponsored system, described in the following section.

At the regional level, concrete steps toward improvement of overall capability for information transfer are sponsored. A pilot translation referral service has been supported in the Arab States to avoid duplication of translation efforts. Other regional pilot projects in Africa, Asia and Latin America are designed to promote co-operation in the introduction of modern information techniques such as computerized information retrieval services and library automation. In the Central European region, initial assistance has been provided for the establishment of a referral centre on information-handling equipment to serve primarily the countries of the region.

Full-scale regional programmes for co-operation in information exchange and the development of national information systems have been proposed in four developing regions and are being considered for funding by UNDP. Such co-operation would emphasize such areas as training and standardization, and would complement regional participation in information networks covering specialized subject fields.

The experience of Unesco is also made available to discipline-oriented programmes concerned with information infrastructure at the international level. As an example, an independent appraisal of AGRIS was organized by Unesco in 1977 at the request of FAO; this study presented recommendations for the future development of the programme on the basis of UNISIST methodology.

At the national level, surveys of existing information facilities are facilitated by published guidelines which have been successfully tested and used in several countries; similar guidelines are under preparation on surveying users' needs for information. Other guidelines bear on the design and development of national information systems. Those now available emphasize the general aspects of national information system development, but the series is being extended to cover all specific institutional links in the information transfer chain such as documentation centres, libraries and archives and modern technologies such as computerization and reprography.

Advisory missions are made available to assist Member States in assessing their resources and needs and in all aspects of information system development. In addition, extensive assistance is made available in the information field through UNDP projects within the framework of the Unesco programme.

NORMS AND STANDARDS FOR INFORMATION EXCHANGE

Normative action is continually required to ensure the possibility for universal access to information by all Member States and networks. An essential role of Unesco thus consists of the proposal of norms relevant to information work, co-operating closely with the International Organization for Standardization which is responsible for their ultimate adoption as international standards, if necessary. The normative action of UNISIST is not generally linked to specific subject disciplines; however, assistance is available to specialized networks and services wishing to develop more detailed disciplinary or mission-oriented tools compatible with the overall UNISIST framework.

A series of world registers of specialized information services is gradually being developed to foster their ultimate linkage into a voluntary world referral network. As one example, the recently completed world inventory of abstracting and indexing services provides information on approximately 3,000 such services in all fields, classed according to subject coverage, language and other characteristics. Other directories cover technical documentation centres and information services covering ongoing research projects.

The world register of periodical titles is maintained through ISDS, which now comprises an International Centre in Paris and a network of thirty national and eight regional input centres. The machine-readable data base of ISDS contains information on about 50,000 periodical publications, each of which is characterized by an International Standard Serial Number (ISSN). The work of ISDS is essential in monitoring the volume and scope of the world's periodical literature, and in permitting secondary services and libraries to evaluate their coverage.

Unified standards for all components of bibliographic descriptions are being developed as a prerequisite to international exchange of bibliographic data. The *UNISIST Reference Manual for Machine-Readable Bibliographic Descriptions* is an accepted norm which has been published in three languages and is being continually updated. As a complementary aspect, Unesco promotes a programme for Universal Bibliographic Control (UBC) to apply available bibliographic standards to the totality of the world's published information.

Further tools are being developed for the standardization of documentary terminologies (including thesauri and index schemes). International UNISIST clearing-houses have been established to centralize information on existing thesauri and to recommend standardized terminology. Guidelines have been published to facilitate the acceptance of a standardized method for thesaurus construction. A 'Broad System of Ordering' has been devised as a broad macro-thesaurus to allow comparison and referral among classification schemes in different fields of knowledge.

In further work aimed at improving the quality of primary publications, four regional associations of scientific editors have been sponsored by Unesco. In addition, a number of guidelines have been completed which propose standardized presentation of several classes of documents such as theses and conference proceedings.

The ultimate result of the norms and standards programme is to be the *UNISIST Manual for Information Handling Procedures*, which will explain all existing standards and guidelines relevant to information handling. It will aim at providing 'UNISIST-recommended' standards so as to ensure a high degree of compatibility of information systems, and will be available in part during the current biennium.

TRAINING IN THE INFORMATION FIELD

The Unesco programme is helping developing countries to build up facilities for the training of needed information manpower. In the meantime, support is provided for the international training of managers and advanced specialists to catalyse development of national information systems and teachers to staff national training programmes for information specialists and users. Training activities are formulated in the context of a need for common approaches and methods in information work to facilitate international exchange of information.

Guidelines are available on the organization and on the evaluation of training courses and two major educational publications have been completed: a handbook (textbook) for a first course in information science and a manual for the education and training of information-users.

Within the General Information Programme, nearly thirty international courses are planned for the current biennium, ranging from short refresher courses and seminars to full-year training programmes. Each course is arranged in co-operation with host-country authorities to accommodate twenty to thirty participants from developing countries. As an example, a successful short course in administration for managers will be given three times in different regions during the current biennium; and a course outline is available to national authorities.

As an example of co-operation with international networks, a common package of training materials is being developed in collaboration with IAEA and FAO to be applied initially within INIS and AGRIS. Additional guidelines are in preparation on training of science and engineering graduates in information use, on developing curricula in information science and on the use of new techniques in teaching information science.

It is hoped that an operational clearing scheme for educational programmes, as well as a co-operative fellowship programme in information science, can soon be developed in co-operation with other international organizations involved in the information field.

THE INFORMATION SERVICES OF UNESCO

Operational services within the Unesco Secretariat are administratively detached from programme activities, but often co-operate closely on substantive matters, as well as providing regular services to both Member States and the Secretariat. At least two classes of information service deserve special mention within the present discussion.

The Division of Library, Archives and Documentation services is responsible for library and computerized documentation services in the fields of competence of Unesco. All documents, either acquired by the library, or produced by Unesco, are listed and indexed in machine-readable format in the bimonthly *Unesco List of Documents and Publications*. In addition, the office makes its facilities available for central processing services of sectoral information activities, such as DARE, for training fellows from Member States in documentation techniques and for advice to the Secretariat in specific documentation projects.

The Office of Statistics is charged with the collection and analysis of statistics relating to education, science and technology, culture and communications. For example, in the field of education 'country education projections until 1985' are prepared in co-operation with the United Nations and made available to Member States and international organizations. A revised International Standard Classification on Education (ISCED) was developed, and adopted at the thirty-fifth session of the International Conference on Education in 1975, to assist Member States in establishing standardized methods of presenting statistical information in education. The office is responsible for the publication of the *Unesco Statistical Yearbook* and the 'Statistical Reports and Studies' series, and co-operates closely with the General Information Programme and other Unesco programme units in development of questionnaires and guidelines to be used in Member States for gathering statistical information.

APPLICATION OF UNISIST TO THE SOCIAL SCIENCES

The very foundation of the UNISIST concept is co-operation to make knowledge available as a function of world information needs, irrespective of traditional disciplines or arbitrary subject distinctions. As early as 1971, the Unesco Secretariat asked the International Committee for Social Science Information and Documentation for an analysis of the UNISIST feasibility study which had just been completed. This analysis looked at the problems raised by the application of the UNISIST recommendations to the social sciences, and reached the conclusion that the social sciences are not radically different from the other sciences in so far as information is concerned; that it should be possible to apply the principles and norms of UNISIST to the social sciences without any major difficulties; and that several of the existing services and measures already taken should be regarded as first steps in this process.

Upon the official launching of UNISIST in 1973, the Department of Social Sciences (now the Social Sciences Sector) immediately began to study the feasibility of such action, and in 1974, the General Conference authorized a programme to encourage international co-operation in the social sciences with a view to improving information and documentation systems, in particular by developing the social science component of UNISIST.

Within the 1975–76 UNISIST programme several activities (especially normative action concerning bibliographic descriptions, terminology and inventories of existing periodicals and abstracting services) were carried out in collaboration with information specialists in the social sciences to ensure completeness and universal applicability. Member States were officially requested to ascertain whether existing national focal points were appropriate to social science information, and in the event of negative findings to name an additional body competent in those fields.

Specific UNISIST activities for the social sciences are being implemented by the Social Sciences Sector of Unesco, in co-ordination with the General Information Programme which is intersectoral in nature. A specialist *ad hoc* committee on social science information is to be set up to advise on this process. In the development of such activities, the following major problem areas have been identified:

Accessibility and dissemination of data. Numerical data suitable for mechanized processing are tending to play an ever greater role in the social sciences and may eventually become even more important than bibliographical data. A world inventory of systems handling this type of information will be completed to facilitate referral of information requests and study on the feasibility of concrete co-operation between systems. In the European region, such practical co-operation is already under way through a conference of social science documentation centres.

Thesauri. Efforts in this field encounter special difficulties in the social sciences, which are due to the fluctuating and sometimes unprecise nature of social science vocabulary. Compilation and international acceptance of multilingual documentary thesauri for the applied social sciences are being encouraged, the greatest care being taken to ensure compatibility among different thesauri. Joint management machinery is envisaged for such works where appropriate.

New subsystems for specialized information. Several projects have already been mentioned to establish world information exchange systems in particularly sensitive areas of the social sciences, economic and social development and population problems. Such projects are being given the necessary consideration to ensure their development within the framework of UNISIST principles.

The example of the social sciences and UNISIST is not presented as a definitive model but only as one way that intersectoral co-operation has developed within the Unesco information programme. The following review of the existing situation in educational information will allow a better comparison with problems already discussed in the natural, engineering and social sciences.

Educational information in the regional and international context

In examining the situation of educational information, one is immediately struck by the variety of arrangements, almost confusing in number, which attest to the lack of systematic and co-ordinated attempts to solve a problem that is of common concern. It is clear that educators have lagged behind scientists in other fields in establishing an effective information system to ensure the transfer of experience. The reasons for this are also obvious. The educational enterprise is a vast one, involving a large number of people as students, teachers, administrators and scholars in every country of the world. The system of education is intimately connected with the culture as well as with the political and economic conditions of each society and this makes exchange of experience between countries something that has to be deliberately planned. Even nationally, the range of information about education is a complex fabric in which policy and administrative items are mixed with the operational, and these with research, so that an adequate information system is not easy to achieve within the country. Such factors explain the present state of development in this field.

An attempt is made below to outline and analyse the situation today. There are two main factors to bear in mind and weave together: the geographical limits of the particular information programme, and the sector (or aspect) of education being treated. To start with, attention is paid to current policies and programmes for developing information services, at regional and interregional levels. Then the activities of Unesco, and particularly of IBE, are examined in some detail. Wherever examples are found of systematic development, in the sense of regular networking operations, these will be stressed. The document finally sums up the problems that confront education, in terms of the principles that can be derived from UNISIST experience. To solve these problems, an effort will have to be made to plan and launch a world information network in education.

CURRENT POLICIES AND PROGRAMMES

Within each region, a number of intergovernmental and non-governmental bodies are concerned with the exchange of educational experience. For the most part, information activities accompany other forms of co-operation for training, research or consultation, and are not yet organized systematically on the basis of networks of existing national institutions. In some cases, however, specific information programmes have been set up with a networking arrangement. The survey below proceeds from the regional to the international level. For the sake of completing each regional view, a number of Unesco units are mentioned, but it should be borne in mind that these are integral parts of the international organization. The full summary account of Unesco's activities is given later in the international section.

In Africa, the Organization of African Unity (OAU) was established in 1963 to promote unity, development and international co-operation among African States, and to co-ordinate and harmonize members' economic, diplomatic, educational, health, welfare, scientific and defence policies. It has a specialized commission, for co-operation in cultural and educational fields, which co-operated with Unesco in the organization of the Conferences of African Ministers of Education (Nairobi, 1968, and Lagos, 1976).

In research and development, a number of non-governmental initiatives have occurred. The African Bureau of Educational Services (BASE) was established in 1974 with its office at Kisangani (Zaire), for the purpose of supporting co-operation in educational research; BASE arranges meetings and has started an information service. More recently, the Basic Education Research Centre (BERC) was set up in Nairobi to foster exchanges between English-speaking countries in the area of basic education.Other specialized programmes with regional scope, notably in science teaching and in social studies, have also taken shape.

For higher education, the Association of African Universities was founded in 1967 by representatives of thirty-five African universities. Among its purposes are the promotion of interchange, contacts and co-operation among member institutions and the collection and dissemination of information on higher education and research, particularly in Africa.

The Unesco Regional Office for Education in Dakar has since its inception engaged in documentation and information services. A fresh impulse to this work was given by the Conference of African Ministers of Education in Lagos when it adopted a recommendation on the creation of a network of educational innovation for development in Africa. The proposed programme was approved by the General Conference at its nineteenth session, to become operational in 1977. The regional co-ordinating mechanism is part of the Dakar office; its activities place considerable emphasis on information flows.

In the Arab States, the Arab Educational, Cultural and Scientific Organization (ALECSO) is a specialized agency of the League of Arab States with the objective of developing co-operation in the Arab world in the fields of education, culture and science. A department of education is responsible for projects of co-operation in the development of education in all Arab countries. The Department of Documentation and Information provides services through gathering and processing documents; preparing materials for basic research; supplying institutions in the Arab world with journals, documents, statistical and bibliographical bulletins; and assisting Arab countries in developing library and documentation services. More recently another organization, a subregional Office of Education for the Arab States, has been set up in Riyadh. Mention should also be made of the Regional Centre for Functional Literacy in Rural Areas for the Arab States (ASFEC) situated in Egypt. ASFEC is equipped with a library, document unit and a clearing-house for the dissemination of information and distribution in the Arab States of publications on various fields of literacy, adult education, community development and rural development. These units are meant to give support to the professionals and trainees at the regional centre as well as to help promote literacy and relevant activities in the region.

The Association of Arab Universities performs a function in higher education similar to those of the university organizations of other regions; it maintains a General Secretariat in Cairo.

In regional co-operation between national documentation centres for education, the Centre for Educational Documentation of the Egyptian Ministry of Education has played a pioneering role, both in the training facilities it has offered to other Arab States and in the dissemination of information.

The Unesco Regional Office for Education in the Arab States has also been charged with information functions since its origin. Recent developments, somewhat parallel to those in Africa, favoured the creation of a regional network for educational innovation (EIPDAS) under the aegis of Unesco. A meeting of High Officials of Ministries of Education in the Arab States (Cairo, October 1976) made detailed proposals for a network to be based on associated centres and institutions, with a national co-ordinating group in each country. A regional unit would be responsible for ensuring the exchange of information and experience between countries and centres. This project was examined by the Regional Conference of Ministers of Education in the Arab States (late 1977).

In Asia, while there is no relevant organization for the entire region, the work of the South East Asian Ministers of Education Organization (SEAMEO) should be noted. Acting through its secretariat, SEAMEO has created a set of specialized institutions for training and research in particular fields (e. g. mathematics and science education in Penang, Malaysia; on language teaching in Singapore, etc.). The subregional programme, including information exchange, is thus based on a networking approach.

The Regional Institute of Higher Education and Development in Asia (RIHED), was established in 1970 with Unesco's assistance as an autonomous regional body. Located in Singapore, the institute undertakes studies, issues publications, disseminates information, conducts research, and organizes workshops and training courses on problems related to higher education in Asia.

The Unesco Regional Office for Education in Asia, Bangkok, has built up an effective documentation centre for gathering and disseminating information related to the needs of Asian educators. The networking concept emerged in 1974 with the start of the Asian Programme of Educational Innovation for Development (APEID) which now comprises forty-five Associated Centres as well as a National Development Group in each Member State of the region.

This is an attempt to foster national information systems for educational innovation, with a regional mechanism provided by a staff unit (ACEID) in the Regional Office in Bangkok. As part of APEID activities, a workshop was organized in Bangkok for documentalists from eleven Associated Centres for the purpose of planning a fuller exchange system serving the Member States in the region (February 1977).

In Western Europe, considerable progress has been made in developing systematic exchanges between the Member States of the Council of Europe. The activities of the Council of Europe in the field of educational documentation and information stem from resolution No. 5 of the Third Conference of European Ministers of Education which was held in October 1962 in Rome. The resolution stressed that intergovernmental co-operation in education is only possible on the basis of an organized exchange of information and recommended that the Council of Europe be given the appropriate means to establish a documentation centre. Pursuant to this resolution, the Documentation Centre for Education in Europe was created in 1964 to provide educational information services to member governments and to the various Council of Europe bodies. Since 1967 the Documentation Centre has been incorporated into the Division for Educational Documentation and Research which acts as a secretariat to the Committees for Educational Documentation and Information and for Educational Research and, as far as documentary services are concerned, to the Standing Conference of European Ministers of Education.

The centre operates a number of information projects in co-operation with national correspondents nominated by member governments among which the European Documentation and Information System for Education (EUDISED) is the most important. It aims at the creation of a computer-based network of national agencies dealing with the main fields of educational information. Work on the EUDISED project started in 1968. In 1969 and 1971 two feasibility studies were carried out. In 1973 EUSIDED standards, format and character presentation appeared. In 1974 the multilingual EUDISED thesaurus was published in English, French and German. The next step was the testing of the system by simulation exercises, the first one carried out in 1974–75 being a register of ongoing and completed research, including pilot projects of research-based innovation, from nine member States; the second lists non-book material suitable for educational use; the third educational articles in periodicals. The results obtained being satisfactory, the products of the simulation exercises will be implemented and issued periodically.

Other activities of the Documentation Centre for Education in Europe are the publication of a newsletter and an information bulletin. Also, since 1974, it has been conducting among Member States a survey of resources in the field of educational information. By means of a special agreement with IBE, the documentation centre collaborates in the Co-operative Educational Abstracting Service project.

In Eastern Europe regular contacts between educational documentation and information centres have led to the planning of a programme within the framework of the CMEA scientific and technical information system.

A wider, all-European approach was followed at a symposium organized in 1974 by the Czechoslovak Government with Unesco support. A second symposium took place in 1977 at the Bratislava Institute for Educational Information, with Unesco and IBE.

While Unesco has no general office or unit for education in Europe, the Organization has supported or set up regional institutions which play an increasingly important part in promoting exchange of experience and information. The European Centre for Higher Education (CEPES) in Bucharest is a Unesco centre; and the European Centre for Leisure and Education in Prague works in the adult education field with Unesco support.

In the Americas, the Organization of American States, established in 1948, has in recent years been increasingly concerned with economic and social development. In 1968, OAS launched new regional programmes for educational, scientific and technical development, with a large training component. Within the OAS structure, the Inter-American Council for Education, Science and Culture directs and co-ordinates the work in its area of specialization, and through its publications, disseminates information on education in South and North America.

A number of institutions have grown up in Latin America for dealing with specific areas or problems in education, with programmes that call for information gathering and dissemination. In even the briefest listing, reference should be made to subregional enterprises: the cultural and educational exchanges between the countries of the Andrés Bello Convention (Bolivia, Colombia, Ecuador, Peru, Venezuela), the more recent co-operation venture in the six Central American countries, where the Coordinación Educativa Centro-Americana has set up a technical commission to act as a co-ordinating body for educational information; and still more recently, the Caribbean Development and Co-operation Committee has decided to establish a regional documentation centre which will deal with education along with other aspects of development. Besides these official efforts, there are also many specialized institutions: for example, the Centro Regional de Construcciones Escolares para América Latina y la region del Caribe (CONESCAL) in Mexico for school buildings; the Centro de Investigación y Desarollo de la Educación (CIDE) in Chile for educational research information; the Asociación Latinoamericana de Educación Radiofónica (ALER) in Argentina for distance education. Unesco has continued its building up of regional centres for higher education by creating, in co-operation with the Government of Venezuela, a centre in Caracas. The Regional Centre for Adult Education and Functional Literacy for Latin America (CREFAL) in Mexico set up a documentation centre in August 1976; in addition to its acquisition lists and translations, it has developed contacts with other documentation and information centres in the region. The library of 53,000 works relates principally to adult education, literacy, socio-economic and community development, especially in Latin America.

More broadly, the Unesco Regional Office for Education in Latin America and the Caribbean (Santiago de Chile) has documentation and information functions for the entire region and the full range of education. The Regional

Conference of Ministers of Education in Latin America (Caracas, 1971) as well as a recent meeting of high officials (Panama, 1976) have stressed the need for strengthening national information services in education and the importance of more systematic exchanges, especially in the area of educational innovation —evidence of support for the programme of the Regional Office in this field.

To complete this survey of policies and programmes, reference should be made to organizations whose composition is wider than a single region and which provides services in educational information:

OECD, through its interest in social and economic development, set up in 1968 the Centre for Educational Research and Innovation (CERI) which has contributed considerably to the flow of information on innovatory experiences by its pilot projects, studies and publications. In 1972 OECD drew up in co-operation with the United Nations agencies the first version of a macro-thesaurus covering the broad fields of social and economic development.

The Council for Mutual Economic Assistance has since 1969 established the International System for Scientific and Technical Information which is gradually extending its work to social sciences and education.

The Commonwealth Secretariat organizes educational conferences and provides an information service on education to the countries of the Commonwealth.

The Agency for Cultural and Technical Co-operation, grouping twenty-two governments of countries of which French is the official or habitual language maintains a documentation service that is focused on educational innovation.

The Oficina de Educación Ibero-Americana (OEI) has a centre of educational documentation and information and issues publications including the monthly journal *Plana* to convey relevant educational news.

In the field of higher education, where associations between universities so often provide regional and international mechanisms for information exchange, mention should be made of the following three institutions:

Commonwealth Association of Universities. First established in London in 1913, it has now as its general objective to serve the interests of universities in countries belonging to the Commonwealth. The association maintains an important documentation service for its members, the best known item being the publication of the *Commonwealth Universities Yearbook.*

AUPELF (*Association des Universités Partiellement ou Entièrement de Langue Française*). The association, established in 1961, has its headquarters at the University of Montreal. It provides its members with information, documentation and technical services, including a permanent microfiche reproduction service of ducuments, articles from journals, doctoral theses, etc.

The International Association of Universities (*IAU*). Created in 1950 to promote co-operation and solidarity among higher education institutions throughout the world, IAU has set up and developed a library and documentation centre which enables the Secretariat to furnish information concerning individual institutions and new developments in higher education in different parts of the world. Among the association's publications mention should be made of the quarterly *Bulletin* and the *World List of Universities.*

In other specialized fields of education, such as adult education, special education and rehabilitation and educational research, there is an even greater wealth of non-governmental organizations at international and regional levels. The number of such bodies in consultative status with Unesco which are active in education exceeds 120. In most cases, the main reason that leads specialists to found and support an organization is the exchange of experience in some particular area. Moreover, a good deal of educational information is gathered and disseminated also by teachers' organizations, particularly the large international federations, as well as by other bodies in the social field such as trade unions, religious organizations, and those dealing with the media.

THE UNESCO FRAMEWORK

In the survey above of the main programmes and services in educational information, there have been recurrent references to Unesco units, usually in a regional context. It is necessary at this point to examine the total role of Unesco's Education Sector, bearing in mind that a co-ordinated programme exists for the Secretariat in Paris, the four Regional Offices for Education and a number of specialized institutes.

The medium-term plan of the Organization sets out a number of objectives —forty-four in all—many of which imply educational action. The programme may be described broadly from two interrelated points of view, operational (i.e the management of co-operative projects with particular countries or groups of countries) and substantive. The latter aspect is usually built into a series of programme activities around the main problem areas encountered in educational development in the Member States: educational policies, planning and administration, including facilities planning; finance; structures, content and methods related to lifelong education; scientific and technical education; higher education and training of educational personnel; special programmes for education for international understanding, co-operation and peace, and for human rights, education for the disadvantaged, and literacy and rural development. In the course of supporting operational projects and of providing Member States with advisory services, the Education Sector of Unesco has to engage in a sequence of information activities: gathering information, conducting studies, disseminating the results. The biennial programme contains a considerable volume of such work in professional areas, partly issued in document form for limited distribution, partly published for a wide public. In these terms, the Education Sector is concerned with a series of contacts and network relationships extending over the areas of formal and non-formal education.

The four Regional Offices for Education in Africa (Dakar), the Arab States (Beirut), Asia (Bangkok) and Latin America (Santiago) constitute staff units of the Sector in these regions, ensuring that certain operational (including training) and substantive functions are carried out in close contact with the countries concerned. The offices play a leading role in the preparation and conduct of the periodical regional conferences of ministers of education; and there has been a recent trend to establish regional networks of educational innovation for development where the Regional Office serves as a linking mechanism. These functions have led the four Regional Offices to undertake an information programme, and thus: (a) to maintain a documentation and information centre in the office with qualified staff; (b) to build up contacts with a network of institutions in the region, particularly with ministries of education, planning offices, documentation and information centres and innovative projects (including teacher training colleges); (c) to disseminate information through a bulletin, bibliographical services and other report series, and to respond to requests for information.

In addition, the Education Sector of Unesco comprises four specialized institutions with international functions (those with regional programmes having been described earlier). A brief account of them follows:

The International Institute for Educational Planning (IIEP), Paris, is responsible for training and research in educational planning. Besides its role in regular institute activities, the IIEP documentation centre has increasingly helped to disseminate knowledge in the field of educational planning. Since its foundation in 1963, the institute has published a great number of studies and surveys; the 'IIEP Documents' series includes occasional papers, research reports and seminar papers.

The Unesco Institute for Education (UIE) was established in Hamburg in 1952. The activities of the Documentation Centre, primarily conceived as a support for the research programme of UIE, are gradually resulting in a clearing-house service on lifelong education and its implementation. The main services provided are: literature search and securing of documentation for the UIE's research projects; regular transmission of relevant materials to co-operating institutions and scholars; and regular diffusion of information on the increasing quantity of literature relating to lifelong education through bibliographies, awareness lists and a newsletter. The institute publishes a quarterly journal *International Review on Education.*

The International Institute of Adult Literacy Method (IIALM) has been established in Tehran to provide information, documentation, research and training services on the methods, media and techniques on adult literacy. It has a documentation centre which publishes a journal entitled *Literacy Documentation* and compiles bibliographies and directories on subjects considered to be of interest to policy-makers and staff members of literacy organizations. IIALM also publishes monographs and sourcebooks for use by literacy workers.

THE INTERNATIONAL BUREAU OF EDUCATION

IBE, like the three institutes described in the previous paragraph, forms a specialized centre of Unesco's Education Sector. However, since its specificity lies in educational information, a somewhat fuller account of IBE is justified.

IBE forms an integral part of Unesco, serving the entire Education Sector as a focal point for gathering, processing and disseminating information; it has a Council of twenty-four Member States designated by the Geneeral Conference of Unesco. Since 1971, the Council has laid down principles for the development of the IBE programme in educational information, stating in the report of its eleventh session (1975): 'It is the role of the IBE to work vigorously towards establishing a world system for the exchange of educational information'. The 1977 International Conference on Education, dealing as it did with this special theme, should therefore be considered not simply as an episode but as an important step in a programme set out several years ago by the IBE Council.

The directives of the council may be summed up in three principles: networking, selectivity, use of modern techniques.

IBE has given priority to developing networks of existing institutions concerned with information flows in education, at both international and national levels. One important element is the group of Unesco units outlined in the previous section, at Headquarters, in the Regional Offices and in the specialized institutes. To these may be added also the programme units and institutes of other Specialized Agencies: ILO (vocational training, workers' education, etc.); the International Centre for Advanced Technical and Vocational Training (Turin); the Action for Development Unit in FAO; and so on.

The major network components are national centres dealing with educational documentation, research and information. As these have been identified, IBE has kept a computerized record which permits of ready publication in directory form every two years. The 1977 *Directory of National Centres* accounts for about a hundred institutions. Alongside the central and general national centres, there are of course other more specialized institutions dealing with particular aspects of education. A similar identification effort, made by the relevant Unesco unit and IBE, has led to the issue of a directory of adult education centres covering some eighty-six institutions.

The identification of network members is no more than a first step. Regular contacts have been built up by an automatic servicing activity. IBE materials and other documents are sent periodically to the centres. In return, IBE requests them to provide information on particular topics, where possible contracting for more extensive work (e.g. the interpretative abstracts described below); and progressively a mutual question and answer service has taken shape. Wherever possible, direct links between national centres, and between them and regional centres, are promoted so as to avoid centralization of the information exchange activities. In these relationships, technical questions about documentation techniques and procedures have come to the fore, so that IBE has been able to start the process of fixing standard procedures, within the broad UNISIST framework, and obtaining participatory involvement of part of the network.

As a matter of policy, particular attention has been given to centres in developing countries. Many of these are of recent origin and lack the necessary human and material resources to carry out their information functions effectively at the national level; to this extent, the international network is the poorer, for the strength of a chain depends on the strength of its individual links. By supporting regional seminars for educational documentalists and information specialists, IBE has helped to promote contacts and exchanges, but the problem of staff development remains to be solved.

The second principle of IBE work is selectivity. Ultimately in any information system the users' needs should determine the content and form of messages, but in developing an international mechanism for educational exchanges, the vast mass of documentation must be kept within manageable limits; hence the need for selection criteria. IBE has adopted the idea of change as its main criterion, as embodied in educational reforms, innovations and policy-oriented research studies. To this end, an International Educational Reporting Service (IERS) was begun in 1974, initially financed by extra-budgetary resources made available by a consortium of international and bilateral agencies and national institutions. The aim of IERS is to make available to policy-makers, administrators, and educational leaders generally, especially in developing countries, information about innovation which will help them in their work for educational change and development. IERS rests on the network principle followed by IBE and the Unesco Regional Offices, but adds an important element to these networks: innovative institutions and even projects. The service also emphasizes the two-way nature of communication which is essential to ensure participation in an information system. In IERS products (a newsletter, *Innovation*, and *Awareness List* and a series of studies entitled 'Experiments and Innovations in Education') a good deal of evidence may be found of the growing participatory activity of the network.

In adopting a selective approach, it is important to evaluate results. Since 1976, a systematic effort has been made to promote a wider use of the bureau's resources and identify the users of information. The general picture that has emerged is that the material sent out to countries has been found useful, although inadequate in quantity. A good proportion of the materials suppled goes to people at the higher echelons of government services, while the intermediate group of educators and the field-workers do not have sufficient access to it. As a result of this assessment (which concerned mainly IERS, but will be extended to the activities of the bureau as a whole) a more systematic attempt is being made to reach the key people who need IBE materials most, and who are in a position to put them to use. One implication is that more resources should be devoted to increasing print runs, in more languages.

In the third place, IBE has attempted to apply modern techniques to the treatment of educational information and thus to provide the networks with some minimum standards and procedures for improving exchanges between centres. The aim here is to develop a computerized data base for ease of reference, supported by a service of original documents in microfiche or of abstracts which may substitute for originals. As the data base takes shape, it is made available to any institution in the network, and a series of printed materials was issued experimentally during 1977 in the following categories:

Terminology—the *Unesco/IBE Education Thesaurus* (English, French, Spanish versions) forms the indexing tool. A four-language glossary has been launched with a volume on special education.

Bibliography—from the computerized abstracts in the data base, subject bibliographies are printed. In particular, clusters of important reports, such as those prepared for the International Conference on Education, are reproduced also in microfiche, so that the bibliography serves as a catalogue to the microfiches.

Directories—the data base contains records of institutions, for the present mainly centres concerned with the information networks, and periodical directories can thus be issued.

Co-operative educational abstracting service—national centres select documents which they believe have international significance and prepare long, interpretative abstracts. IBE edits and issues these in two languages. This series is not yet computerized. It is particularly useful as a means of overcoming language barriers.

Country profiles—those are in effect abstracts or summaries of national education systems.

The data base elements just listed arise from co-operative efforts within the Unesco Secretariat and between IBE and national centres, and all of them involve a certain degree of standardization. The entire programme is evolving towards being a recognizable system, but some essential parts still occur in an unsystematized form, notably the comparative studies, state of the art papers and case materials prepared by the Unesco Secretariat in Paris, the institutes and IBE.

Finally, systems-interconnection must be borne in mind. Some important national data bases for education are emerging—of which ERIC in the United States is the best-known example. There are also regional schemes, EUDISED in Western Europe being the pioneer among them. And among international organizations, ILO has an important data base which includes elements on education and training. IBE has attempted to ensure compatibility between the Unesco/IBE data base and these other systems, when necessary by preparing concordances.

THE PROBLEM AND POSSIBLE SOLUTIONS

The above status report on regional and international programmes for exchanging educational information may usefully be set against the experience in other fields and the UNISIST principles for action, in order to show the problems that lie before educators.

The first problem is of a policy nature, and raises the question of the political will of governments to require and support a more systematic form of exchange. Progress in the fields of nuclear science and agriculture can be traced to the readiness of countries to co-operate and to give priority to these particular fields. In the case of education, there needs to be a clear recognition of the importance, for each national system, of educational experience abroad. For the most part, the wide, ill-defined limits of education and training seem to dilute awareness of the problem. It may be, too, that the many *ad hoc* opportunities for exchanges of experience, such as conferences, visits and inter-institutional links, obscure a need for systematic arrangements for exchanging educational information.

A closely related issue is that of recognized leadership. Where successful systems of information and networks have emerged in other fields, there has been agremeent in allotting a role of co-ordination and promotion to some given institutions. The educational field displays a variety of initiatives, with geographical and subject specialization criteria, which inevitably produces a patchwork result, overlapping and uneconomic use of resources.

The second problem—or rather, set of problems— relates to the professional content of existing information streams at the international level. Because official bodies, such as branches of Ministries of Education, are the main channels for such flows, there is a tendency to deal largely with experience codified in traditional terms—the statistics and facts relating to the formal system of education. Many of the growing points of education can well be overlooked: innovatory experiences at local level; the work of non-educational agencies in agriculture, health, vocational training; the merging development issues such as self-reliance, problems of marginal groups, technical co-operation among developing countries. Just as there is some difficulty in ensuring nationally an adequate inter-agency and interdisciplinary approach to education, the same difficulty is compounded at the international level when one examines the information flows.

To some extent, this also raises the question of the users of information. International programmes tend to be built from the top down, designed to reach a limited group of national and international administrators. As long as such a limitation results from a deliberate search for economy and for multiplier effect, it is acceptable; but it stands or falls by the degree to which, in each country, mechanisms are available to bring this international information to the field-workers (teachers and researchers) and to involve them in contributing in their turn. In other words, international networks succeed only when they are nested into national programmes or systems.

In the third place, the very nature of education places some constraints on adequate communication between countries. To describe an educational experiment or achievement in one country so that it may be meaningfully studied by educators elsewhere is no easy task. The entire context, as well as a host of factors, political, social, economic, needs to be set out to make the experience understandable. This fact is one reason why arrangements for exchanges between neighbouring countries, or within single regions, are relatively easier to achieve than world-wide exchanges. But, since international co-operation proceeds from the assumption that all countries have something to contribute to the pool of educational knowledge, and something to draw from it, an effort is needed to find universal solutions to these communication problems. The floating terminology of education, lack of common patterns for describing educational experiences, language barriers—these are some of the difficulties that must be overcome. In this connection, audio-visual materials like video tape appear to hold great promise; although they are frequently used within education sytems for instructional purposes, they are scarcely ever applied in international communication for comparative education purposes. Yet the visual presentation of an experience might well surmount the obstacles that beset written reports.

The fourth set of problems relates to training. It is clear that developing countries suffer from a dearth of professional people in the field of educational information: librarians and documentalists, editors, writers, journalists, analysts and others able to make use of computer techniques. However, the problem is not confined to the developing regions; in reality it is found everywhere. Even where trained professionals are more numerous, the interdisciplinary nature of educational information services makes it difficult to locate suitable people. There is, thus, a general problem of pre-service and in-service training for those who handle exchanges of educational information.

But the issue is not simply one of finding information specialists. More broadly, the question is to what extent all people, and in particular educators, are prepared for using information and documentation. The attempt to develop self-instructional methods and to establish resource centres or multi-media centres in schools and colleges shows that practising educators are aware of the needs. It is clear that the provision of educational information depends on the use made of it; to awaken and sustain an awareness of the need for information, to give educators a knowledge of resources and how to use them—these are further areas for continuous learning.

SOLUTIONS

Experience in fields other than education has shown the possibilities of international co-operative networking in providing each country with the needed information from abroad. Such arrangements offer economical and effective solutions to the problems of dealing with a rising volume of documentation and information. While the educational scene is one of a multiplicity of efforts, with resulting gaps or duplication of work, there seem to be some promising beginnings. What is needed at this point in time is a clear statement of goals and means to which all education authorities in Member States could subscribe.

In the first place, a solution will depend on national action designed to strengthen the internal information system in education. Here policies, the development of institutions, adequate funding and the status and training of educational information specialists are all inovlved. And all countries are involved.

By extension, recognition by national authorities of the importance of international exchanges of educational information is indispensable. As long as these exchanges remain marginal, no great progress can be expected.

In the second place, a specific mandate should be given. The analysis in this chapter tends to show that Unesco is in fact the one organization capable of undertaking the task and that through the mechanism of IBE, a world information network in education could be achieved within the next decade.

If this mandate is given, the main principles of action can be outlined. They comprise: (a) the networking approach, with regional information programmes developed by the Unesco Regional Offices and merged into a world-wide network by the Unesco Secretariat and IBE; (b) adoption by national centres and regional programmes of common standards and procedures so that modern techniques can be applied to educational information exchanges; (c) acceptance of a co-operative approach, both for the free sharing of educational experience between countries and for supporting the growth of information services in countries where they are still weak.

Finally, if such policies and principles are recommended internationally, their implementation will depend on the extent to which resources are made available, both nationally and through international co-operation. The goal of a world information network in education is an attractive direction, and the steps to achieve it are sufficiently well known. What remains to be done is the establishment of a co-operative scheme for pooling knowledge and resources and allocating these to priority areas.

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Educational information sources in developing countries: a selective annotated directory

Unesco Secretariat

One of the first steps in creating an effective mechanism for the exchange of information in educational policy and planning is being aware, as much as possible, of how much of this information is available and where. Establishing a list of institutions known to be dealing with information related to this topic is one of the means for locating this information. This article has been undertaken as a first step towards establishing such a list; it does not in any way pretend to be complete or systematic.

Owing to the wide variety of patterns for organizing information systems within various countries it is not always easy to point out which institutions are most relevant to our topic in a particular country.

Among the various countries, educational information in general is considered as any of the following: (a) a component of a centralized national information system; (b) a component of the educational system, most often the Ministry of Education; (c) an informal network centred around and loosely co-ordinated by a national (governmental) organ.

Regarding information on educational policy and planning, it has not always been possible to identify an institution in every country which deals principally with this type of information. Thus, the list has been expanded in some cases to include institutions which deal with relevant information within the framework of a wider mandate, such as 'development', 'human resources', etc.

Africa

National institutions from the categories listed below could conceivably deal in exchange of educational information.

GOVERNMENTAL ORGANS

Although few countries in Africa have explicit policies regarding educational information, many have an implicit policy implemented through the ministries or other governmental or semi-governmental organs. For example, *Nigeria* expects to develop the Research and Information Section in the Federal Ministry of Education to enable it to perform its functions satisfactorily as a storehouse for educational information.

Some of the African countries have a unit specializing in educational planning within their Ministries of Education while others deal with educational planning as a part of other units within the ministry. For instance, *Botswana* has a unit specifically dealing with educational planning, as does *Ethiopia*. The latter has not only the Educational Planning Services in the Ministry of Education, but also the Central Planning Commission as well as several university departments dealing with educational planning. Likewise, the *Upper Volta* has not only the Direction de la Planification de l'Éducation in the ministry, but also a Centre de Documentation et de Perfectionnement Pédagogique (details given below).

In *Togo*, the Bureau Pédagogique (Education Office) and the Centre de Documentation Pédagogique of the Ministry of Education work along with the Institut Pédagogique National on educational problems, including that of information exchange. In the case of the *Central African Republic*, educational planning activities are entrusted to both the Second Vice Prime Minister responsible for education, youth, sports, arts and culture as well as to the Minister of State responsible for planning, international co-operation and statistics. Similarly, '*Planification de l'Éducation et Emploi*' is of direct concern to the Government of *Zaire*.

NATIONAL PEDAGOGICAL INSTITUTES AND INSTITUTES OF EDUCATION

Besides governmental organs, some of the potentially important points of contact in many of the countries are the *instituts pédagogiques nationaux*, found in many francophone countries, and their anglophone counterparts, usually called institutes of education. The former, which maintain training and research activities as well as documentation and audio-visual services, are usually directly or indirectly under the control of the Ministry of Education, although in the case of some countries such as *Zaire*, they are a part of a university.

The Institute of Education in *Mauritius*, attached to the Ministry of Education to and the Institute of Education of the *United Republic of Tanzania*, established in the University of Dar es Salaam, trains in-service teachers and conducts curriculum development and educational research. It works closely with the Ministry of National Education, teacher training colleges and schools throughout the country, as well as with the Department of Education of the University.

INSTITUTES AND DEPARTMENTS OF EDUCATION WITHIN UNIVERSITIES

In addition to institutes of education, many universities in Africa have research institutes or departments with which contacts could possibly be made when envisioning establishment of information links in educational planning in the future. Such institutes may concentrate on educational planning *per se* or on the broader topics of education or development.

One of the institutes dealing with the broader topic of development is the Institute for Development Studies at the University of Nairobi, *Kenya*. More directly involved in educational planning is the Institute for Educational Planning and Administration, University of Cape Coast, *Ghana*. Dealing with education in general, there is the Faculty of Education, University of Ife, and the Institute of Education, University of Ibadan, both in *Nigeria*, which concentrate on training but also have research and documentation activities. The latter publishes several publications, including the *West African Journal of Education*.

In *Senegal*, there is the Centre de Recherche, de Documentation et d'Équipement Pédagogique of the École Normale Supérieure, which publishes *Dossiers Pédagogiques Documentaires* (*DOPEDOC*) and participates in training, research and documentation activities.

In *Ethiopia*, there are the Faculty of Education and the Institute of Development Research of Addis Ababa University.

EDUCATION DOCUMENTATION AND RESEARCH CENTRES

Another type of institution dealing with educational information is the documentation and research centre specializing in education, such as the Centre de Documentation Pédagogique in *Mauritania*. Such centres are usually attached to the Ministry of Education or to a university. Although they generally serve professors and students, they either maintain exchange relations with other centres and other countries or express a desire to have such relations.

Arab States

In this fast-growing area where the population is generally more scattered than in other regions, the major responsibility of educational information exchange appears to have been left to governments rather than private institutes.

In terms of policy, the majority of the Arab States deal with educational information as part of the general educational system.

In *Jordan*, for example, educational information is considered as 'a part and component of the educational system, and not part of a broader national information system'. An educational documentation centre in the Ministry of Education acts as the focal point of a network, composed of educational directorates in governorates and districts; it also ensures liaison with international organizations. The functions of the ministry centre are defined as being 'to help educators of all types to improve and develop the educational process in the light of new trends and ideas in education; to support educators with new documents which carry the results of educational studies and researches which will promote their professional knowledge and to inform them of the evolution of education all over the world'. The Directorate of Educational Planning of the Ministry of Education is the principal body responsible for educational planning activities.

Likewise, in *Sudan*, there is a National Educational Documentation and Research Centre in the Ministry of Education, forming an integral part of the national educational system. It is the 'only centre that deals with educational information inside and outside the country'. It collects and disseminates information on education, and has working relations with other documentation centres. A quarterly bulletin in Arabic, *El Tawheek El Tarbawy (Educational Documentation)*, as well as various reports are published. Information about educational planning can also be obtained from the Planning Research and Documentation Administration, also of the Ministry of Education. There are no institutions in Sudan responsible for training in educational planning. The provincial educational offices also perform information and documentation functions, but they are as yet not united in a national network.

Egypt, which also deals with educational information in the Ministry of Education, has a national centre but does not use the networking approach to ensure the flow of information. The 'Documentation Centre' which is a department attached to the ministry, not only directly serves the needs of decision-makers and planners in their respective ministries, but also provides services to teachers and to research workers. Its aims are to collect and disseminate information on education, to produce bibliographies, exchange educational materials, co-operate with Unesco in developing educational documentation services in the Arab region, organize training courses in the field of educational documentation for persons in charge of educational documentation centres and libraries in Egypt and the Arab world, and prepare studies in the field of education, especially comparative studies. Carrying out such research as comparative studies in education and historical studies, it maintains relations with Unesco and other educational agencies as well as with institutions in Egypt, the Arab States and elsewhere.

The Sous-Direction des Études et de la Documentation Générale (Centre de Documentation) of *Algeria* also serves the educational information needs of the Ministry of Primary and Secondary Education, mainly serving the internal needs for information in the ministry, although teachers also have access to the centre.

The Centre National de Documentation Pédagogique of the Institut Pédagogique National (also in *Algeria*) maintains more information dissemination activities than the centre mentioned above. Directed by the Ministère de l'Orientation (Ministry of National Guidance), the general aim of this institute is to encourage and improve education at all levels in accordance with plans and directives established by the government. The Institute also makes educational materials and teaching aids developed through its services available to interested bodies. The documentation centre is responsible for collecting and diffusing information needed by the institute in its work, and also for diffusing information for the general improvement of the educational system, for the teaching profession and for school administrators.

In neighbouring *Tunisia*, the Institut National des Sciences de l'Éducation, supervised by the Ministry of National Education, does research, conducts seminars and provides documentation and teaching materials for educational administrators, teachers and researchers.

In the *Socialist People's Libyan Arab Jamahiriya*, information and studies on educational planning are dealt with in the Educational Documentation and Research Centre of the Secretariat of Education, while educational planning in general is the responsibility of the Department of Planning and Follow-up in the Secretariat. The Educational Documentation Centre aims at providing documentation services in the field of education (bibliographies and information) to research workers, official personnel and other people concerned, and at exchanging educational information and documents with similar bodies aborad.

In the Gulf region, *Iraq* also has a unit in the Ministry of Education dealing with educational planning, the Directorate-General for Educational Planning. At the University of Baghdad, there is the Educational and Psychological Research Centre. In *Kuwait*, the ministerial unit responsible for educational planning is the Department of Planning and Training. We also find there the Arab Planning Institute, a regional institute dealing mainly with the broader aspects of economic and social planning. There is a Planning Unit in the Ministry of Education of *Bahrain* as well.

Both the Technical Research Department and the Educational Planning Unit deal with educational planning in the Ministry of Education of *Qatar*. However, according to the government, there are no institutions in the country which provide training in either educational planning or management.

Asia

The majority of countries in the Asian region appear to consider educational information an integral part of the educational system. Therefore, institutions within the ministry of education or those administered by it usually deal with educational information. In the case of educational planning information, therefore, the educational planning units within the ministries would be the first point of contact.

Such a central unit for educational information exists in *Indonesia*. In addition to the Planning Bureau of the Secretariat General, Ministry of Education and Culture, there is in the ministry a Data Processing, Statistics and Concept Centre established by presidential decree in 1974 which 'has the task to organize and co-ordinate an information system in education and culture'. The functions of the centre are based on policies determined by the Office of Educational and Cultural Research and Development (BP3K) which is the research and development arm of the ministry.

In *Malaysia*, three institutions collectively function as educational information and documentation centres: the Educational Planning and Research Division and the Curriculum Development Centre of the Ministry of Education, and the Examination Syndicate. At the state level, the thirteen state education offices also deal with information gathering, but there is no national co-ordinating body.

As for educational planning, the above-mentioned Educational Planning and Research Division within the Ministry of Education, which prepares a variety of studies of alternative means for planning for development of the educational system and publishes a number of journals and studies, is the main unit dealing with that subject.

Some countries do not have a clear policy on national educational information, considering it an implicit function of the educational system. Therefore, rather than have one national co-ordinating centre, the function of all information may be spread over a variety of institutions. For example, in the case of *India*, with the federal structure, state ministries and institutes of education perform information functions for the respective states. At the centre, a cluster of institutions is involved: the National Council for Educational Research and Training, the National Institute of Educational Planning and the University Grants Commission. Recently the Central Advisory Board for Education approved a revised system for the collection of educational information for the whole country, and a national network could readily be established. Note should also be taken of the India Planning Commission.

In *Sri Lanka*, there is an implicit policy to treat information as a part of both the educational system and of a broader national information system. On the institutional level, the Curriculum Development Centre serves as a research centre and a clearing-house for the dissemination of educational information, along with the Planning Division in the Ministry of Education, the latter being mainly responsible for information related to educational planning, reforms and statistics. There is the Marga Institute (the Sri Lanka Centre for Development Studies), which deals with broader development issues. The Marga Institute has organized and undertaken an extensive and widely diversified programme of activities including analytical studies and research projects on a selected range of socio-economic issues, seminars and public discussions ranging from the village to the international level, a special programme of translations and an experimental research-cum-action project on small-scale rural enterprise. In selecting the areas and problems for study, the institute has invariably considered their relevance to the national priorities as set out by the government. In carrying out its programme of work, the institute has established contact with concerned scholars and institutes both in Sri Lanka and abroad.

Likewise, in the *Republic of Korea*, there is, for the time being, no single institution dealing with educational information for the country as a whole. The National Institute of Education, established in the Ministry of Education, the Korean Institute of Research in Behavioural Science (KIRBS) and the Korean Educational Development Institute (KEDI) are the main centres concerned with gathering and disseminating information in education. There are plans for setting up a special educational information centre in KEDI to 'provide quick, valid and relevant information for government officials, professors, researchers, and school teachers, etc.' There are also institutes attached to provincial boards of education such as the Jellabukdo Education Research Institute, which studies its local educational system and the ways to improve it.

The Department of Planning of the Ministry of Education of *Afghanistan* has the following functions: (a) planning the development of education, excluding the university, as this institution has its own planning bureau; (b) negotiations for and co-ordination of foreign aid to education; (c) liaison between the Ministry of Education, Kabul University and the Ministry of Planning; and (d) training courses for educational planners, the provincial directors of educations, etc.

The Educational Planning Office of the Ministry of Education of *Thailand* is concerned with integrating educational plans with the economic and social development of the country and conducting studies and research on selected educational conditions for the solution of problems and for increasing the efficiency of educational policy formulation and administration.

Pakistan has two bodies involved with educational information—the Central Bureau of Education and the Institute of Education and Research. The former, which is a department attached to the Ministry of Education, has the following functions: to identify major educational problems of immediate significance for the national economic and social development and to plan, design and execute research studies related to the solution of the problems.

The Institute of Education and Research is a constituent part of the University of Panjab, but has its own Board of Governors. It provides teaching, training and guidance in order to prepare candidates for the degrees of Master of Arts and Doctor of Philosophy in Education and such other diplomas as may be instituted and provides and promotes facilities for advanced study and research in education.

Latin America

Various patterns for organizing educational planning information are found in Latin America. In some of the countries educational information is treated as part of the national educational system. For example in *Argentina* there is a National Centre for Educational Information and Documentation in the Ministry of Education. In addition the twenty-two provinces have already established their own centres. An effective network has been built up with national and provincial centres and a considerable number of specialized libraries at both the national and provincial level. A list of addresses of provincial centres specializing in educational planning appears at the end of this section. In addition, the Centro de Investigaciones en Ciencias de la Educación (CIDE) operates out of the Instituto Torcuato di Tella in Buenos Aires, and the Centro de Estudios sobre Administración y Supervisión de la Educación (CEASE) deals with educational planning and administration.

There are other countries which deal with educational information as part of the general educational system.

In *Ecuador*, the Centro de Documentación e Información Educativa of the Ministerio de Educación y Deportes deals with educational organization, planning and research.

In *Haiti*, the Conseil National de Développement et de Planification (CON-DEP) operates out of the ministry.

In *Bolivia*, the units responsible for educational planning are the Director Nacional de Planeamiento Educativo in the Ministry of Education and Culture and the Consejo Nacional de Educación Superior—CNES.

In *Colombia*, the Oficina Sectorial de Planeación Educativa of the Ministerio de Educación Nacional is the unit responsible for educational planning. There are a number of institutes and universities throughout the country also dealing with educational planning.

On the other hand, in some of the other countries, educational information operates as part of a subsystem of national information systems. For instance, in *Peru* educational information is considered a subsystem of the overall national information system (SENADI). Co-ordination between the various systems is the responsibility of the Communication and Information Unit in the Ministry of Education. The most specialized institution, depending on the Ministry of Education, is the National Institute for Educational Research and Development Salazar Bondy (INIDE) part of which forms a documentation centre (SUDDE—Sub-Dirección de la Documentación). However, this centre has no co-ordinating functions *vis-à-vis* the other centres operating in the regional educational directorate.

In *Chile*, educational information is also considered as part of a broader information system, under a co-ordinating centre for scientific and technical information (CONICYT). A documentation centre attached to the Office of the Superintendent meets the needs of the Ministry of Education, but has no authority to co-ordinate the work of regional educational secretariats which perforce also carry out information functions.

Cuba has an explicit policy regarding pedagogical documentation and information as part of a larger information system. The system of educational information forms an integral part of the National System of Scientific and Technical Information. Pedagogical documentation and information constitute a national branch system directed by the National Directorate of Scientific and Technical Information and closely linked to other educational documentation and information centres of the country. There is a strong national centre in Havana which co-ordinates a network of centres in the provinces.

Other national institutions in Latin America include the Oficina de Planeamiento Integral de la Educación of *Honduras*, and the Centro de Estudios Educativos of *Mexico*.

In *Brazil* there are the Centro Regional de Pesquisas Educacionais of São Paulo dealing with quality improvements in education and the Programa de Expansâo e Melhoria do Ensino (PREMEN) operating out of the Ministry of Education and Culture.

Appendix: List of institutions

S.C.E.R.T., West Bengal
Library
Calcutta
25/3, B. C. Road

Africa

BENIN

Institut Pédagogique National, Centre de Recherche et d'Application Pédagogiques
B. P. 200, Porto-Novo.

BOTSWANA

Educational Planning, c/o Ministry of Education, Private bag 005, Gaborone.

BURUNDI

Centre de Recherches et de Documentation Pédagogiques, Institut Universitaire des Sciences de l'Éducation, B. P. 1060, Bujumbura.

CENTRAL AFRICAN REPUBLIC

Le 2^e Vice-Premier Ministre Chargé de l'Éducation Nationale, de la Jeunesse, des Sports, des Arts et de la Culture, B, P, 791, Bangui.
Le Ministre d'État, Chargé du Plan, de la Coopération Internationale et des Statistiques, B. P. 732, Bangui.

CHAD

Centre National de Documentation Pédagogique, B. P. 731, N'Djamena.

CONGO

Centre National de Recherche et d'Action Pédagogique, B. P. 2128, Brazzaville.

ETHIOPIA

Central Planning Commission, P. O. Box 1037, Addis Ababa.
Educational Planning Services, Ministry of Education, P. O. Box 1367, Addis Ababa.
Faculty of Education, Addis Ababa University, P. O. Box 1176, Addis Ababa.
Institute of Development Research, Addis Ababa University P. O. Box 1176, Addis Ababa.

GHANA

Institute for Educational Planning and Aministration, University of Cape Coast, Cape Coast.

KENYA

Institute for Development Studies, University of Nairobi, P. O. Box 30197, Nairobi.

MADAGASCAR

Centre de Documentation Pédagogique et Office du Cinéma Éducateur (Educational Documentation Centre and Office for Educational Films), Ministère de l'Éducation Nationale, Tananarive.

MALI

Institut Pédagogique National, B. P. 71, Bamako.

MAURITANIA

Centre de Documentation Pédagogique (Educational Documentation Centre), P. O. Box 171, Nouakchott.

MAURITIUS

Mauritius Institute of Education, Cr. Royal and Boundary Roads, Rose Hill.

NIGER

Centre Pédagogique du Ministère de l'Éducation Nationale, B. P. 234, Niamey.

NIGERIA

Research and Information Section, Federal Ministry of Education, Lagos.
Nigerian Educational Research Council, Lagos.
Institute of Education, University of Ibadan, PMB 5142, Ibadan.
Faculty of Education, University of Ife, Ile-Ife.

RWANDA

Institut Pédagogique National, B. P. 56, Butaré.

SENEGAL

École Normale Supérieure, Centre de Recherche, de Documentation et d'Équipement Pédagogiques, Avenue Habib Bourguiba, B. P. 5036, Dakar.

TOGO

Bureau Pédagogique (Education Office), Direction de l'Enseignement, Ministère de l'Éducation Nationale, Lomé.
Institut Pédagogique National, B. P. 1306, Lomé.

THE UNITED REPUBLIC OF CAMEROON

Institut de Pédagogie Appliquée à vocation rurale (IPAR), B. P. 1168, Yaoundé.

UNITED REPUBLIC OF TANZANIA

Institute of Education, University of Dar es Salaam, P. O. Box 35.094, Dar es Salaam.

UPPER VOLTA

Direction de la Planification de l'Éducation, Ministère de l'Éducation Nationale et de la Culture, B. P. 1308, Ouagadougou.
Centre de Documentation et de Perfectionenement Pédagogique, B. P. 7403, Ouagadougou.

ZAIRE

Planification de l'Éducation et l'Emploi, Présidence de la République, Kinshasa.
Institut Pédagogique National (IPN), B. P. 8815, Kinshasa.

Arab States

ALGERIA

Sous-Direction des Études et de la Documentation Générale (Centre de Documentation), 8 avenue de Pékin, Le Golf, Algiers.
Institut Pédagogique National (National Pedagogical Institute), Centre National de Documentation Pédagogique (National Center for Educational Documentation), 11 rue Zaatcha, Algiers.

BAHRAIN

Director of Planning, Ministry of Education, P. O. Box 43, Bahrain.

EGYPT

Documentation Center for Education, 33 Falaki Street, Cairo.
National Planning Institute, Madinet Nasr, Cairo.

IRAQ

Directorate-General for Educational Planning, Ministry of Education, Baghdad.
Educational and Psychological Research Center, University of Bagdahd, Waziriyah, Baghdad.

JORDAN

Educational Doc. Center, Ministry of Education, Amman.
Directorate of Educational Planning, Ministry of Education, Amman.

KUWAIT

Training Centre, Department of Planning and Training, Ministry of Education, P. O. Box 7, Kuwait.
The Arab Planning Institute, P. O. Box 5834, Kuwait.

QATAR

Educational Planning Unit, Ministry of Education, Doha.

SOCIALIST PEOPLE'S LIBYAN ARAB JAMAHIRIYA

Educational Documentation Centre, 82 First of September Street, Tripoli.
Department of Planning and Follow-up, Secretariat of Education, Tripoli.

SUDAN

Planning, Research and Documentation Administration, Ministry of Education, Khartoum
Educational Documentation Centre, P. O. Box 2490, Khartoum.

TUNISIA

Institut National des Sciences de l'Éducation, 17 rue Fénélon, Tunis.

Asian region

AFGHANISTAN

Department of Planning, Ministry of Education, Kabul.

BANGLADESH

The Foundation for Research on Educational Planning and Development, (room 207) Institute of Education and Research Building, University of Dacca, Nilkhet Road, Dacca 2.

BURMA

Burma Educational Research Bureau, 426 Prome Road, Rangoon.

INDIA

National Council for Educational Research and Training, New Delhi.
National Institute of Educational Planning, Sri Aurobindo Marg, New Delhi, 110006.
University Grants Commission, New Delhi.
India Planning Commission Yojana Bhavan, New Delhi.

INDONESIA

Planning Bureau of the Secretariat General, Ministry of Education and Culture, Jl. Jendral Sudirman. Jakarta.
Data Processing, Statistics and Concept Centre, Ministry of Education and Culture, Jakarta.
Office of Educational and Cultural Research and Development (BP3K), Ministry of Education and Culture, Jakarta.

IRAN

Institute of Educational Planning and Administration, Meidan Iran Novin (Aryamehr) Koucheh Imam, Tehran.

Institute for Research and Planning in Science and Education, 46 Shareza Avenue, Kakh Cross Road, Tehran.

MALAYSIA

Higher Education, Educational Planning and Research Division, Ministry of Education, 142, Jalan Davidson, Kuala Lumpur.
Curriculum Development Center, Ministry of Education, Kuala Lumpur.
Examinations Syndicate, Kuala Lumpur.

PAKISTAN

Central Bureau of Education, Government of Pakistan, Section H-9, Islamabad.
Institute of Education and Research, University of the Panjab, CPOL 484, Lahore.

REPUBLIC OF KOREA

National Institute of Education, Ministry of Education, Seoul.
Korean Institute of Research in Behavioral Science (KIRBS), Seoul.
Korean Educational Development Institute (KEDI), 20-1 Umyeon Dong Gangman-Gu, Seoul.

SRI LANKA

Curriculum Development Centre, Colombo.
Planning Division, Ministry of Education, Colombo.
The Marga Institute (Sri Lanka Center for Development Studies), 61 Isi Pathana Mawatha (or P. O. Box 601), Colombo 5.

THAILAND

Educational Planning Office, Ministry of Education, Bangkok.

Latin America

ARGENTINA

Centro de Investigaciones en Ciencias de la Educación (CIDE), Instituto Torcuato di Tella, Freire 1673, Buenos Aires.
Centro de Estudios sobre Administración y Supervisión de la Educación (CEASE), Buenos Aires.

BOLIVIA

Director Nacional del Planeamiento Educativo, Ministerio de Educación y Cultura, La Paz.
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